PB86-191483

# Environmental Assessment of an Enhanced Oil Recovery Steam Generator Equipped with an EPA (Environmental Protection Agency) Heavy Oil Low-NOx Burner. Volume 2. Data Supplement

Acurex Corp., Mountain View, CA

Prepared for

Environmental Protection Agency
Research Triangle Park, NC

Apr 86

**U.S. Department of Commerce**
**National Technical Information Service**
NTIS

PB86-191433

EPA/600/7-86/013b
April 1986

# ENVIRONMENTAL ASSESSMENT OF AN ENHANCED OIL RECOVERY STEAM GENERATOR EQUIPPED WITH AN EPA HEAVY OIL LOW-$NO_x$ BURNER

## Volume II
## Data Supplement

by

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EPA Contract 68-02-3188

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SPRINGFIELD, VA. 22161

## TECHNICAL REPORT DATA
*(Please read Instructions on the reverse before completing)*

| | | |
|---|---|---|
| 1. REPORT NO.<br>EPA/600/7-86/013b | 2. | 3. RECIPIENT'S ACCESSION NO.<br>PB86 191483/AS |
| 4. TITLE AND SUBTITLE<br>Environmental Assessment of an Enhanced Oil Recovery Steam Generator Equipped with an EPA Heavy-oil Low-NOx Burner; Volume II* | | 5. REPORT DATE<br>April 1986 |
| | | 6. PERFORMING ORGANIZATION CODE |
| 7. AUTHOR(S)<br>C. Castaldini, L.R. Waterland, and R. De Rosier | | 8. PERFORMING ORGANIZATION REPORT NO. |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Acurex Corporation<br>Energy and Environmental Division<br>P.O. Box 7044<br>Mountain View, California 94039 | | 10. PROGRAM ELEMENT NO. |
| | | 11. CONTRACT/GRANT NO.<br>68-02-3188 |
| 12. SPONSORING AGENCY NAME AND ADDRESS<br>EPA, Office of Research and Development<br>Air and Energy Engineering Research Laboratory<br>Research Triangle Park, NC 27711 | | 13. TYPE OF REPORT AND PERIOD COVERED<br>Final; 1/84 - 1/85 |
| | | 14. SPONSORING AGENCY CODE<br>EPA/600/13 |

15. SUPPLEMENTARY NOTES AEERL project officer is Joseph A. McSorley, Mail Drop 65, 919/541-2920. Volume I contains technical results. (*) Volume II is Data Supplement.

16. ABSTRACT The report gives results of comprehensive emission measurements and 30-day flue gas monitoring on a 16-MW (55 million Btu/hr) enhanced oil recovery steam generator equipped with the EPA low-NOx burner firing high-nitrogen crude. The 1-day comprehensive measurements included quantification of semivolatile organics and 73 trace elements; volatile organic sampling train quantitation of volatile organic priority pollutants; EPA Method 5/8 for particulate and SOx; controlled condensation for SOx; Andersen impactors for particle size distribution; grab samples for N2O; and continuous flue gas monitoring. NOx emissions averaged 70 ppm at 3% O2, well below the target of 85 ppm. CO emissions were below 30 ppm, and SO2 averaged about 550 ppm. Solid particulates were emitted at about 27 ng/J (96 mg/dscm); condensible particulates were about half that. Volatile organics (benzene, toluene, and ethylbenzene) were measured in the 0.4 to 20 ppb range. Semivolatile organics (naphthalene and phenol) were detected at about 0.3 ppb. Subsequent continuous monitoring of flue gas criteria emissions showed NOx below 80 ppm at 3% O2 with an average of 70 ppm. CO emissions were generally less than 30 ppm.

17. KEY WORDS AND DOCUMENT ANALYSIS

| a. DESCRIPTORS | b. IDENTIFIERS/OPEN ENDED TERMS | c. COSATI Field/Group |
|---|---|---|
| Pollution | Pollution Control | 13B |
| Assessments | Stationary Sources | 14B |
| Boilers | Environmental Assessment | 13A |
| Oil Recovery | | 08I, 11H |
| Crude Oil | Low-NOx Burners | |
| Combustion | | 21B |

| | | |
|---|---|---|
| 18. DISTRIBUTION STATEMENT<br>Release to Public | 19. SECURITY CLASS *(This Report)*<br>Unclassified | 21. NO. OF PAGES<br>193 |
| | 20. SECURITY CLASS *(This page)*<br>Unclassified | 22. PRICE |

EPA Form 2220-1 (9-73)

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# ABSTRACT

Comprehensive emission measurements and 30-day flue gas monitoring were performed on a 16-MW (55 million Btu/hr) enhanced oil recovery steam generator equipped with the EPA low-$NO_x$ burner firing high-nitrogen crude. The 1-day comprehensive measurements included quantification of semivolatile organics and 73 trace elements; volatile organic sampling train (VOST) quantitation of volatile organic priority pollutants; EPA Method 5/8 for particulate and $SO_x$; controlled condensation for $SO_x$; Andersen impactors for particle size distribution; grab samples for $N_2O$; and continuous flue gas monitoring. $NO_x$ emissions during the comprehensive tests averaged 70 ppm at 3 percent $O_2$, well below the target level of 85 ppm. CO emissions were below 30 ppm, and $SO_2$ averaged about 550 ppm. Solid particulates were emitted at about 27 ng/J (96 mg/dscm); condensible particulates were about half that level. Volatile organics (benzene, toluene, and ethylbenzene) were measured in the 0.4 to 20 ppb range. Semivolatile organics (naphthalene and phenol) were detected in the 0.3 ppb range. Subsequent continuous monitoring of flue gas criteria emissions showed $NO_x$ below 80 ppm at 3 percent $O_2$ with an average of 70 ppm. CO emissions were generally less than 30 ppm.

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## SECTION 1

## INTRODUCTION

The purpose of this data supplement is to document test data in greater detail than was possible in Volume I (Technical Results) of this report. It is intended to provide sufficient detail for researchers to perform their own analysis of the data obtained. Readers are referred to the technical volume (Volume I) for objectives, description of the source tested, data interpretations, and conclusions.

The remaining sections of this data supplement contain the following information:

Section 2: Preliminary Tests and Equipment Calibration -- Stack velocity traverse and nozzle sizing and flow calculations; equipment calibration data

Section 3: Steam Generator Operating Data -- Field data sheets of steamer operating conditions from available test meters

Section 4: Sampling Data Sheets -- Emission data obtained with continuous monitoring instrumentation. Operating data tables for combined EPA Methods 5/8 (for particulate mass and $SO_x$ emissions), source assessment sampling system (SASS) (for trace element and organic emissions), volatile organic sampling train (VOST) (for volatile organic species emissions), Andersen impactor (for particulate size distribution), controlled condensation system (for $SO_2$, $SO_3$), and EPA Method 7 (for $NO_x$ certification)

Section 5: Analytical Results -- Fuel proximate and ultimate analyses; laboratory reports for particulate emissions and size distribution by gravimetric analyses; sulfur oxides emissions by wet chemical analysis; trace element analyses by spark source mass spectrometry (SSMS); atomic absorption spectroscopy (AAS) and other methods; total chromatographable organic (TCO) and gravimetric organic (GRAV) results, determination of organic compounds by gas chromatography/mass spectrometry (GC/MS) and infrared (IR) spectra of GRAV residues, volatile organics analyses of VOST traps by GC/MS; $N_2O$ analysis by GC/electron capture detector (ECD); and laboratory analyses for $NO_x$ by EPA Method 7.

# SECTION 2

# PRELIMINARY TESTS AND EQUIPMENT CALIBRATION

# PRELIMINARY VELOCITY TRAVERSE

PLANT Chevron (EFR) SVS-69
DATE 2-1-84
LOCATION Outlet
STACK I.D. 36
BAROMETRIC PRESSURE, in. Hg 29.26
STACK GAUGE PRESSURE, in. $H_2O$
OPERATORS Best

SCHEMATIC OF TRAVERSE POINT LAYOUT

West

| TRAVERSE POINT NUMBER | VELOCITY HEAD ($\Delta p_s$), in. $H_2O$ | STACK TEMPERATURE ($T_s$), °F |
|---|---|---|
| 1 | .27 | |
| 2 | .35 | |
| 3 | .37 | 415 |
| 4 | .37 | 418 |
| 5 | .38 | 429 |
| 6 | .40 | 433 |
| 7 | .45 | 436 |
| 8 | .47 | 437 |
| 9 | .48 | 438 |
| 10 | .48 | 438 |
| 11 | .50 | 438 |
| 12 | .48 | 438 |
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| | | |
| AVERAGE | | |

| South | TRAVERSE POINT NUMBER | VELOCITY HEAD ($\Delta p_s$), in. $H_2O$ | STACK TEMPERATURE ($T_s$), °F | |
|---|---|---|---|---|
| .22 | 1 | .20 | | 432 |
| .25 | 2 | .22 | | 454 |
| .27 | 3 | .23 | 417 | 458 |
| .28 | 4 | .23 | ~~417~~ | 459 |
| .30 | 5 | .23 | ~~420~~ | 459 |
| .32 | 6 | .23 | ~~42~~ 435 | 457 |
| .34 | 7 | .50 ~~.26~~ | ~~427~~ 431 | 455 |
| .36 | 8 | .47 ~~.28~~ | ~~432~~ | 451 |
| .37 | 9 | .50 ~~.32~~ | ~~433~~ 426 | 452 |
| .38 | 10 | .50 | 423 | 451 |
| .40 | 11 | .52 | 420 | 450 |
| .40 | 12 | .53 | ~~417~~ | 448 |
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| | | | | |
| | | | | |
| | AVERAGE | | | |

## ISOKINECTIC SAMPLING WORKSHEET

Plant Chevron (EER)

Peformed by Best

Date 2-1-83

Sample Location

Test No./Type m 5/8

$$K = \frac{782.687\ (Cp)^2\ (1-B_{wo})^2\ P_s\ M_d}{K_o^2\ M_s\ P_m}$$

where: K = Contant of fixed and assumed parameters (dimensionless)

| | | |
|---|---|---|
| Pitot coefficient (dimensionless) | $C_p$ | .84 |
| Water vapor in the gas stream (proportion by volume) | $B_{wo}$ | .11 |
| Absolute stack gas pressure (in. Hg) | $P_s$ | 29.31 |
| Molecular weight, stack gas dry (lb/lb-mole) | $M_d$ | 30.36 |
| Orifice coefficient (dimensionless) | $K_o$ | .699 |
| Molecular weight, stack gas wet (lb/lb-mole) $M_d(1-B_{wo}) + 18(B_{wo})$ | $M_s$ | 29.00 |
| Abolute meter pressure (in. Hg) | $P_m$ | 29.38 |
| $\frac{782.687\ (.84)^2\ (1-.11)^2\ (29.31)\ (30.36)}{(.699)^2\ (29.00)\ (29.38)}$ | K | 935.06 |

Barom 29.28

$O_2$ 2.9

$CO_2$ 14.0

83.1

M.N. = 8.525

# ISOKINECTIC SAMPLING WORKSHEET

Plant chevron                                        Peformed by Kaufmann
Date 2/1/84
Sample Location
Test No./Type SASS #1

$$K = \frac{782.687\ (Cp)^2\ (1-B_{wo})^2\ P_s\ M_d}{K_o^2\ M_s\ P_m}$$

where: K = Contant of fixed and assumed parameters (dimensionless)

| | | |
|---|---|---|
| Pitot coefficient (dimensionless) | $C_p$ | .816 |
| Water vapor in the gas stream (proportion by volume) | $B_{wo}$ | 0.11 |
| Absolute stack gas pressure (in. Hg) | $P_s$ | Static +.5 |
| Molecular weight, stack gas dry (lb/lb-mole) | $M_d$ | $CO_2$ - 14<br>$O_2$ - 3<br>$N_2$ · 83 |
| Orifice coefficient (dimensionless) | $K_o$ | 3.356<br>α 1.039 |
| Molecular weight, stack gas wet (lb/lb-mole) $M_d(1-B_{wo}) + 18(B_{wo})$ | $M_s$ | |
| Abolute meter pressure (in. Hg) | $P_m$ | 29.26 |
| $\frac{782.687\ (\_\_\_)^2\ (1-\_\_\_)^2\ (\_\_\_)\ (\_\_\_)}{(\_\_\_)^2\ (\_\_\_)\ (\_\_\_)}$ | K | 38.419 |

.69
Nd / 3[illegible]

## ISOKINECTIC NOZZLE CALCULATION
## AND
## SAMPLING RATE CALCULATION

Plant Chevron

Performed by Kaufmann

Date 2/1/84

Sample Location ____

Test No./Type SASS #1

$$N_d = \left(\frac{\Delta H\ T_s}{K\ T_m\ \Delta P}\right)^{.25}$$

where: $N_d$ = Nozzle diameter (inches)

| | | |
|---|---|---|
| Average pressure differential across the orifice meter (in. $H_2O$) | $\Delta H$ | |
| Temperature stack gas, average ($^oF$) | $T_s$ | |
| Temperature of gas meter, average ($^oF$) | $T_m$ | |
| Stack gas velocity pressure (in $H_2O$) | $\Delta P$ | |
| $\left(\frac{(\_\_\_)\ (\_\_\_ + 460)}{(\_\_\_)\ (\_\_\_ + 460)(\_\_\_)}\right)^{.25}$ | $N_d$ | |

$$\Delta H = K\ (N_d)^4\ \frac{T_m}{T_s}\ (\Delta P)$$

where: $\Delta H$ = Pressure differential across the orifice meter (in $H_2O$)

| | | |
|---|---|---|
| Nozzle diameter, actual (inches) | $N_d$ | .674 |
| Temperature of gas meter ($^oF$) | $T_m$ | |
| Temperature of stack gas ($^oF$) | $T_s$ | |
| Stack gas velocity pressure (in $H_2O$) | $\Delta P$ | |
| $\left((\_\_\_)\ (\_\_\_)^4\ \frac{(\_\_\_ + 460)}{(\_\_\_ + 460)}\ (\_\_\_)\right)$ | $\Delta H$ | |
| Magic number ____ $(\quad)^4$ | $K(N_d)^4$ | 7.93 |

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# ANDERSEN SAMPLING CALCULATIONS

Plant Chevron SVS-69
Date 2-22-84
Test Location Outlet
Pitot Coefficient ($C_p$) ______
Duct Dimension ______

Barometric Pressure ($P_G$) ______ " Hg
Static Pressure ($P_{st}$) ______ " $H_2O$
Meter Temp ($T_m$) ______ °F
Meter Rate ($R_m$) ______ cfm
Clock Time ______

1) Stack Pressure: $P_s = P_b + \frac{P_{st}}{13.6} = 29.36 + \frac{\quad}{13.6} = 29.36$ in. Hg.

2) Mole Fraction Dry Gas: $M_f = 1 - \frac{\%H_2O}{100} = 1 - \frac{11}{100} = .89$

3) Mol. Wt. Dry Flue Gas:

$MW_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%CO) + (0.28 \times \%N_2)$

$= (0.44 \times 14.0) + (0.32 \times 2.5) + (0.28 \times \_\_\_) + (0.28 \times 83.5) = 30.34$

4) Mol. Wt. Flue Gas:

$MW_s = (MW_d) \times (M_f) + [18 \times (1 - M_f)]$

$= 30.34 \times .89 + [18 \times (1 - .11)] = 28.98$

5) Stack Gas Velocity:

$V_s = 85.49 \times (Cp) \times \sqrt{\Delta P}\ \text{avg} \times \sqrt{\frac{T_s + 460}{P_s \times MW_s}}$

$= 85.49 \times .82 \times \sqrt{.44} \times \sqrt{\frac{530 + 460}{29.36 \times 28.98}} = 50.16$ fps

6) Sample Rate:

$Q_n = 0.327 \times (V_s) \times (D_n)^2$

$= 0.327 \times 50.14 \times (.25)^2 = 1.02$ acfm

7) Meter Rate:

$R_m = (Q_n) \times \frac{P_s}{P_m} \times \frac{T_m + 460}{T_{st} + 460} \times M_f \times \alpha^{1.000}$

$1.68 \left(\frac{R_m}{K_o}\right)^2 = \Delta H$

$= 1.025 \times \frac{29.36}{29.39} \times \frac{70 + 460}{530 + 460} \times .89 = 0.488$ cfm

$1.68 \left(\frac{\quad}{.67}\right)^2 = 0.89$ "$H_2O$

## CONTROL MODULE CALIBRATION

Module I.D. #105
Date 10-5-83
Barometric Pressure (in. Hg) 30.07
Primary Meter I.D. 433583
Ambient Temperature (°F) 78°
Operator S.A. Smith

| Orifice Size | Orifice Reading ΔH (in $H_2O$) | Primary Meter Gas Volume $V_p$ ($ft^3$) | Meter Box Gas Volume $V_d$ ($ft^3$) | Temperature | | | | | | Time θ (min) | Meter Correction Factor α | Orifice Coefficient $K_o$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Primary Meter | | | Meter Box Meter | | | | | |
| | | | | Inlet $T_{pi}$ (°F) | Outlet $T_{po}$ (°F) | Average $T_p$ (°F) | Inlet $T_{di}$ (°F) | Outlet $T_{do}$ (°F) | Average $T_d$ (°F) | | | |
| Small Orifice 0.187 | .6 | 23.710 | 22.960 | 98<br>78 | 93<br>77 | 86.5 | 69<br>72 | 68<br>71 | 70 | 58.5 | 1.000 | .670 |
| | 2.0 | 22.595 | 22.145 | 78<br>79 | 77<br>76 | 77.5 | 72<br>74 | 71<br>72 | 72.3 | 30.2 | .994 | .677 |
| | 4.0 | 26.155 | 25.680 | 79<br>84 | 76<br>78 | 79.3 | 74<br>74 | 72<br>73 | 73.3 | 25.7 | 1.003 | .650 |
| | 5.4 | 21.655 | 21.230 | 84<br>86 | 78<br>79 | 81.8 | 74<br>75 | 73<br>74 | 74 | 18.2 | 1.008 | .654 |
| Medium Orifice 0.281 | .6 | 70.235 | 68.985 | 86<br>86 | 79<br>81 | 83 | 75<br>76 | 74<br>76 | 75.3 | 65.3 | .998 | 1.771 |
| | 2.0 | 43.130 | 42.265 | 86<br>99 | 81<br>85 | 87.8 | 76<br>80 | 76<br>77 | 77.3 | 23.0 | 1.004 | 1.688 |
| | 4.0 | 30.820 | 30.175 | 99<br>105 | 85<br>89 | 94.5 | 80<br>80 | 77<br>77 | 78.5 | 12.1 | 1.018 | 1.620 |
| | 5.4 | 33.060 | 32.340 | 105<br>109 | 89<br>92 | 98.8 | 80<br>83 | 77<br>78 | 79.5 | 11.2 | 1.027 | 1.614 |
| Large Orifice 0.358 | .6 | 37.865 | 36.910 | 109<br>104 | 92<br>90 | 98.8 | 83<br>81 | 78<br>79 | 80.3 | 16.9 | 1.010 | 3.672 |
| | 2.0 | 33.680 | 33.210 | 104<br>114 | 90<br>94 | 100.5 | 81<br>85 | 79<br>80 | 81.8 | 8.9 | 1.025 | 3.392 |
| | 4.0 | 73.560 | 73.500 | 114<br>121 | 94<br>103 | 108 | 85<br>90 | 80<br>82 | 84.3 | 14.4 | 1.053 | 3.231 |
| | 5.4 | 25.950 | 26.155 | 121<br>122 | 103<br>105 | 112.8 | 90<br>92 | 82<br>84 | 87 | 4.5 | 1.069 | 3.131 |

$$\alpha = \frac{V_d \left(P_B + \frac{\Delta H}{13.6}\right)(T_p + 460)}{V_p\,(P_B)\,(T_d + 460)}$$

$$K_o = \frac{V_p}{\theta \sqrt{\frac{\Delta H\,(T_d + 460)}{P_B\,(28.96)}}}$$

| Orifice | Avg. α | Avg. $K_o$ |
|---|---|---|
| Small | 1.001 | .662 |
| Medium | 1.012 | 1.673 |
| Large | 1.039 | 3.356 |

# SECTION 3

# STEAM GENERATOR OPERATING DATA

# STEAMER OPERATING DATA
## COMPREHENSIVE TEST - 2-1-84

| Time | Oil Flow | | Feedwater | | Steam | | Combustion Air | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Gallons | Temperature (°F) | BPD X1000 | Total Barrels | Pressure (Psi) | Temperature (°F) | Primary Air Flow[a] mV | Secondary Air Flow[b] mV | Temperature At Fans (°F) |
| 9.30 | | 264 | 3.6 | 2516.1 | 1000 | 535 | 4.70 | 1.84 | 65 |
| 9.45 | 33312.1 | 265 | 3.6 | 2548.0 | 1000 | 535 | 4.80 | 2.00 | 65 |
| 10.00 | 33314.10 | 265 | 3.6 | 2581.7 | 1000 | 535 | 4.65 | 3.10 | 65 |
| 10.15 | 33316.45 | 266 | 3.6 | 2618.5 | 1000 | 535 | 4.50 | 2.40 | 67 |
| 1030 | 33318.50 | 267 | 3.6 | 2654.1 | 1000 | 535 | 4.58 | 2.40 | 67 |
| 1045 | 33320.26 | 267 | 3.6 | 2693.5 | 1020 | 535 | 4.41 | 2.58 | 66 |
| 1100 | 33323.18 | 267 | 3.6 | 2729.5 | 1020 | 535 | 4.70 | 2.56 | 66 |
| 1115 | 33325.49 | 267 | 3.6 | 2767.0 | 1020 | 535 | 4.68 | 2.11 | 66 |
| 1130 | 33327.37 | 264 | 3.6 | 2800.2 | 1020 | 535 | 4.73 | 2.22 | 69 |
| 1145 | 33329.53 | 265 | 3.6 | 2836.4 | 1020 | 535 | 4.82 | 2.30 | 70 |
| 1200 | 33331.85 | 268 | 3.6 | 2874.2 | 1020 | 535 | 4.72 | 2.28 | 68 |
| 1215 | 33334.30 | 267 | 3.6 | 2912.8 | 1020 | 535 | 4.65 | 2.32 | 67 |
| 1230 | 33336.28 | 267 | 3.6 | 2946.0 | 1020 | 535 | 4.60 | 2.33 | 68 |
| 1245 | 33338.54 | 267 | 3.6 | 2984.6 | 1020 | 535 | 4.65 | 2.24 | 67 |
| 1300 | 33341.05 | 266 | 3.6 | 3024.3 | 1020 | 535 | 4.56 | 2.43 | 72 |
| 1315 | 33342.91 | 267 | 3.6 | 3057.4 | 1020 | 535 | 4.60 | 2.36 | 70 |
| 1330 | 33345.01 | 265 | 3.4 | 3095.2 | 1010 | 538 | 4.71 | 2.06 | 69 |
| 1345 | 33347.40 | 266 | 3.4 | 0293 | 1010 | 535 | 4.70 | 2.03 | 73 |
| 1400 | 33349.27 | 264 | 3.4 | 059.9 | 1020 | 535 | 4.70 | 2.01 | 71 |
| 1415 | 33351.69 | 266 | 3.4 | 096.2 | 1080 | 545 | 4.76 | 1.97 | 71 |
| 1436 | 33354.57 | 266 | 3.4 | 142.9 | 1190 | ~560 | 4.65 | 2.19 | 71 |
| 1445 | 33356.00 | 266 | 3.4 | 165.2 | 1220 | 560+ | 4.62 | 2.48 | 73 |
| 1500 | 33357.80 | 268 | 3.4 | 201.8 | 1240 | 560+ | 4.65 | 2.40 | 70 |
| 1515 | 33360.25 | 267 | 3.4 | 238.6 | 1250 | 560+ | 4.62 | 2.40 | 73 |
| 1530 | 33362.53 | 267 | 3.4 | 268.1 | 1280 | 560+ | 4.63 | 2.38 | 72 |
| 1545 | 33364.61 | 269 | 3.4 | 299.3 | 1280 | 560+ | 4.71 | 2.34 | 70 |
| 1600 | 33367.07 | - | 3.4 | 336.7 | 1280 | 570+ | 4.70 | 2.35 | 68 |
| 1618 | 33369.78 | - | 3.4 | 377.7 | 1290 | 570+ | 4.70 | 2.35 | 68 |
| 1630 | 33371.48 | - | 3.4 | 404.0 | 1300 | 570+ | 4.76 | 2.45 | 69 |
| 1645 | 33373.75 | - | 3.4 | 439.0 | 1300 | 570+ | 4.70 | 2.30 | 55 |
| 1700 | 33376.26 | 269 | 3.4 | 475.9 | 1300 | 560+ | 4.70 | 2.30 | 69 |
| 1715 | 33378.42 | 269 | 3.4 | 511.7 | 1300 | 560+ | 4.55 | 2.29 | 70 |
| 1730 | 33380.28 | 268 | 3.4 | 540.8 | 1300 | 560+ | 4.70 | 2.32 | 69 |
| 1745 | 33382.40 | 269 | 3.4 | 574.6 | 1300 | 560+ | 4.67 | 2.35 | 69 |

# STEAMER OPERATING DATA
# COMPREHENSIVE TEST – 2-1-84

| Time | Oil Flow | | Feedwater | | Steam | | Combustion Air | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Gallons | Temperature (°F) | BPD X1000 | Total Barrels | Pressure (Psi) | Temperature (°F) | Primary Air Flow[a] mV | Secondary Air Flow[b] mV | Temperature At Fans (°F) |
| 1800 | 33384.93 | 269 | 3.4 | 606.9 | 1300 | $560^+$ | 4.74 | 2.30 | ? |
| 1815 | 33386.53 | 269 | 3.4 | 643.4 | 1300 | $560^+$ | 4.70 | 2.26 | 69 |
| 1830 | 33389.24 | 269 | 3.4 | 678.0 | 1300 | $560^+$ | 4.70 | 2.33 | 70 |
| 1845 | – | 269 | 3.4 | 710.4 | 1300 | $560^+$ | 4.70 | 2.36 | 69 |
| 1900 | – | 269 | 3.4 | 745.7 | 1300 | $560^+$ | 4.54 | 2.79 | 69 |
| 1920 | – | 270 | 3.4 | 794.0 | 1300 | $560^+$ | 4.68 | 2.43 | 68 |
| 1945 | 334006.0 | 268 | 3.4 | 850.5 | 1320 | $560^+$ | 4.60 | 2.65 | 67 |
| 2000 | 334027.0 | 268 | 3.4 | 885.4 | 1320 | $560^+$ | 4.41 | 2.78 | 66 |
| 2015 | 334048.0 | 267 | 3.4 | 917.3 | 1320 | $560^+$ | 4.26 | 3.00 | 65 |
| 2030 | 334075.1 | 267 | 3.35 | 953.8 | 1320 | $560^+$ | 4.40 | 2.80 | 64 |
| 2045 | 334094.4 | 267 | 3.35 | 983.8 | 1320 | $560^+$ | 4.38 | 2.78 | 63 |
| 2100 | 334120.2 | 267 | 3.35 | 1021.6 | 1330 | $560^+$ | 4.46 | 2.92 | 63 |
| 2115 | 334143.8 | 266 | 3.3 | 1053.9 | 1330 | $560^+$ | 4.39 | 2.90 | 61 |
| 2145 | 334188.0 | 267 | 3.3 | 1123.5 | 1320 | $560^+$ | 4.74 | 2.21 | 61 |

a Primary Air Flow (scfm) = $63777 \left(\frac{V}{T(R)}\right)^{1/2}$

b Secondary Air Flow (scfm) = $82777 \left(\frac{V}{T(R)}\right)^{1/2}$

# SECTION 4

# SAMPLING DATA SHEETS

4.1 Continuous Monitoring Data

4.2 Field Data Sheets for EPA Method 5/8, SASS, VOST, Andersen Impactor, Controlled Condensation (CCS), and EPA Method 7

## 4.1 CONTINUOUS MONITORING DATA

ACUREX Aerotherm

# FIELD DATA SHEET

Plant CHEVRON
Location SVS 27-69
Operator BEST
Date 1-21-84
Load Range

Ambient Temperature 54°F
Barometric Pressure 29.44 (1101)
Static Pressure Duct
Fuel LEASE CRUDE

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1030 | | | | 2.9 | | 90 | 593 | | 68 | | | | | | | | | | |
| 1130 | | | | 2.7 | | 70 | 589 | | 66 | | | | | | | | | | |
| 1230 | | | | 2.6 | | 76 | 595 | | 67 | | | | | | | | | | |
| 1330 | | | | 4.7 | | 35 | 594 | | 63 | | | | | | | | | | |
| 1430 | | | | 4.7 | | 15 | 595 | | 61 | | | | | | | | | | LOST FLOW TO NOx |
| 1530 | | | | 4.7 | | 20 | 620 | | 61 | | | | | | | | | | ANALYZER 15·16 -1600 |
| 1630 | | | | 4.7 | | 20 | 619 | | 64 | | | | | | | | | | |
| 1730 | | | | 2.8 | | 55 | 607 | | 70 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX
Aerotherm

# FIELD DATA SHEET

Plant CHEVRON
Location SVS-69 (EGR)
Operator BEST
Date 1-22-84
Load Range

Ambient Temperature 570F 550F
Barometric Pressure 29.51(0920) 27.44(1240)
Static Pressure Duct
Fuel LEASE CRUDE

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0030 | | | | 2.9 | | 50 | 618 | | 69 | | | | | | | | | | |
| 0130 | | | | 2.9 | | 45 | 609 | | 65 | | | | | | | | | | |
| 0230 | | | | 2.8 | | 50 | 620 | | 65 | | | | | | | | | | |
| 0330 | | | | 2.9 | | 50 | 613 | | 67 | | | | | | | | | | |
| 0430 | | | | 2.9 | | 50 | 604 | | 64 | | | | | | | | | | |
| 0530 | | | | 2.6 | | 35 | 625 | | 61 | | | | | | | | | | |
| 0630 | | | | 2.7 | | 40 | 617 | | 59 | | | | | | | | | | |
| 0730 | | | | 3.0 | | 40 | 601 | | 59 | | | | | | | | | | |
| 0830 | | | | 2.7 | | 40 | 609 | | 58 | | | | | | | | | | |
| 1030 | | | | 3.0 | | 50 | 594 | | 69 | | | | | | | | | | |
| 1130 | | | | 2.9 | | 55 | 589 | | 68 | | | | | | | | | | |
| 1230 | | | | 2.8 | | 30 | 611 | | 66 | | | | | | | | | | |
| 1330 | | | | 2.8 | | 20 | 595 | | 65 | | | | | | | | | | |
| 1430 | | | | 2.8 | | 35 | 606 | | 64 | | | | | | | | | | |
| 1530 | | | | 4.7 | | 10 | 609 | | 66 | | | | | | | | | | |
| 1630 | | | | 2.8 | | 40 | 614 | | 63 | | | | | | | | | | |
| 1830 | | | | 3.0 | | 45 | 602 | | 67 | | | | | | | | | | |
| 1930 | | | | 3.2 | | 45 | 602 | | 69 | | | | | | | | | | |
| 2030 | | | | 3.1 | | 40 | 595 | | 67 | | | | | | | | | | |
| 2130 | | | | 3.1 | | 40 | 587 | | 65 | | | | | | | | | | |
| 2230 | | | | 3.2 | | 45 | 603 | | 65 | | | | | | | | | | |
| 2330 | | | | 3.1 | | 40 | 584 | | 66 | | | | | | | | | | |
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ACUREX Aerotherm

# FIELD DATA SHEET

Plant CHEVRON (EER)
Location SVS 27-69
Operator BEST
Date 1-23-84
Load Range

Ambient Temperature
Barometric Pressure 29.54 (0600)
Static Pressure Duct
Fuel LEASE CRUDE

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0030 | | | | 3.1 | | 40 | 589 | | 66 | | | | | | | | | | |
| 0130 | | | | 3.0 | | 40 | 605 | | 64 | | | | | | | | | | |
| 0230 | | | | 3.1 | | 40 | 606 | | 64 | | | | | | | | | | |
| 0330 | | | | 3.0 | | 35 | 598 | | 63 | | | | | | | | | | |
| 0430 | | | | 3.0 | | 35 | 589 | | 64 | | | | | | | | | | |
| 0630 | | | | 3.0 | | 35 | 587 | | 63 | | | | | | | | | | |
| 0730 | | | | 3.1 | | 45 | 571 | | 69 | | | | | | | | | | |
| 0830 | | | | 3.1 | | 45 | 585 | | 66 | | | | | | | | | | |
| 0930 | | | | 3.5 | | 45 | 555 | | 64 | | | | | | | | | | |
| 1030 | | | | 3.2 | | 15 | 559 | | 60 | | | | | | | | | | |
| 1130 | | | | 3.1 | | 35 | 550 | | 44 | | | | | | | | | | |
| 1230 | | | | 2.8 | | 25 | 553 | | 63 | | | | | | | | | | |
| 1330 | | | | 2.8 | | 20 | 566 | | 63 | | | | | | | | | | |
| 1430 | | | | 3.0 | | 15 | 574 | | 60 | | | | | | | | | | |
| 1530 | | | | 3.0 | | 15 | 570 | | 60 | | | | | | | | | | |
| 2030 | | | | 3.6 | | 10 | 599 | | 68 | | | | | | | | | | |
| 2130 | | | | 3.6 | | 20 | 575 | | 69 | | | | | | | | | | |
| 2230 | | | | 3.5 | | 25 | 576 | | 71 | | | | | | | | | | |
| 2330 | | | | 3.5 | | 20 | 571 | | 68 | | | | | | | | | | |
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032 1/82

# FIELD DATA SHEET

ACUREX Aerotherm

Plant CHEVRON (EER)
Location SVS 27-69
Operator BEST
Date 1-24-84
Load Range

Ambient Temperature 56°F 70°F
Barometric Pressure 29.65 (1100) 29.54 (1345)
Static Pressure Duct
Fuel LEASE CRUDE

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0030 | | | | 3.6 | | 15 | 560 | | 71 | | | | | | | | | | |
| 0130 | | | | 3.4 | | 15 | 572 | | 69 | | | | | | | | | | |
| 0230 | | | | 3.5 | | 15 | 580 | | 67 | | | | | | | | | | |
| 0330 | | | | 3.5 | | 15 | 571 | | 70 | | | | | | | | | | |
| 0430 | | | | 3.5 | | 20 | 576 | | 67 | | | | | | | | | | |
| 0530 | | | | 3.6 | | 15 | 561 | | 65 | | | | | | | | | | |
| 0630 | | | | 3.5 | | 15 | 569 | | 71 | | | | | | | | | | |
| 0730 | | | | 3.2 | | 25 | 570 | | 67 | | | | | | | | | | |
| 0930 | | | | 3.3 | | 10 | 586 | | 67 | | | | | | | | | | |
| 1030 | | | | 3.2 | | 15 | 552 | | 69 | | | | | | | | | | |
| 1130 | | | | 2.6 | | 10 | 560 | | 65 | | | | | | | | | | |
| 1230 | | | | 2.1 | | 10 | 577 | | 63 | | | | | | | | | | |
| 1330 | | | | 3.3 | | 5 | 528 | | 62 | | | | | | | | | | |
| 1408 | | | | 3.1 | | 5 | 532 | | 60 | | | | | | | | | | |
| 1423 | | | | 3.2 | | 5 | 523 | | 60 | | | | | | | | | | |
| 1438 | | | | 3.3 | | 5 | 515 | | 59 | | | | | | | | | | |
| 1453 | | | | 3.2 | | 5 | 511 | | 59 | | | | | | | | | | |
| 1508 | | | | 3.0 | | 5 | 524 | | 59 | | | | | | | | | | |
| 1523 | | | | 3.4 | | 5 | 520 | | 57 | | | | | | | | | | |
| 1538 | | | | 3.1 | | 5 | 525 | | 59 | | | | | | | | | | |
| 1653 | | | | 3.3 | | 20 | 561 | | 65 | | | | | | | | | | |
| 1708 | | | | 3.3 | | 25 | 562 | | 65 | | | | | | | | | | |
| 1723 | | | | 3.3 | | 25 | 557 | | 64 | | | | | | | | | | |
| 1738 | | | | 3.2 | | 25 | 554 | | 65 | | | | | | | | | | |
| 1753 | | | | 3.3 | | 30 | 555 | | 64 | | | | | | | | | | |
| 1808 | | | | 3.2 | | 25 | 560 | | 63 | | | | | | | | | | AVERAGE |
| 1823 | | | | 2.5 | | 25 | 589 | | 64 | | | | | | | | | | |
| 1838 | | | | 2.4 | | 30 | 589 | | 65 | | | | | | | | | | |

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# FIELD DATA SHEET

**ACUREX Aerotherm**

Plant
Location
Operator
Date 1-24-84 (CONTINUED)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1853 | | | | 2.5 | | 30 | 585 | | 67 | | | | | | | | | | |
| 1908 | | | | 2.6 | | 30 | 585 | | 53 | | | | | | | | | | |
| 1923 | | | | 2.6 | | 25 | 606 | | 53 | | | | | | | | | | |
| 1938 | | | | 0.1 | | 20 | 30 | | 39 | | | | | | | | | | |
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ACUREX Aerotherm

# FIELD DATA SHEET

Plant CHEVRON (EER)
Location SECTION 27 UNIT 69
Operator BEST
Date 1-25-84
Load Range

Ambient Temperature 61°F
Barometric Pressure 29.50 (1100)
Static Pressure Duct
Fuel LEASE CRUDE

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1059 | | | | 2.9 | | 20 | 610 | | 71 | | | | | | | | | | |
| 1113 | | | | 2.7 | | 20 | 615 | | 70 | | | | | | | | | | |
| 1128 | | | | 2.6 | | 20 | 608 | | 72 | | | | | | | | | | |
| 1143 | | | | 2.6 | | 25 | 606 | | 69 | | | | | | | | | | |
| 1158 | | | | 2.6 | | 20 | 606 | | 68 | | | | | | | | | | |
| 1213 | | | | 2.8 | | 20 | 589 | | 66 | | | | | | | | | | |
| 1229 | | | | 2.7 | | 30 | 589 | | 69 | | | | | | | | | | |
| 1243 | | | | 2.7 | | 30 | 578 | | 70 | | | | | | | | | | |
| 1258 | | | | 2.8 | | 30 | 564 | | 70 | | | | | | | | | | |
| 1313 | | | | 2.6 | | 30 | 573 | | 68 | | | | | | | | | | |
| 1328 | | | | 2.5 | | 25 | 563 | | 69 | | | | | | | | | | |
| 1343 | | | | 2.6 | | 30 | 565 | | 66 | | | | | | | | | | |
| 1358 | | | | 2.7 | | 25 | 554 | | 65 | | | | | | | | | | |
| 1413 | | | | 2.4 | | 25 | 565 | | 67 | | | | | | | | | | |
| 1428 | | | | 2.5 | | 15 | 560 | | 65 | | | | | | | | | | |
| 1443 | | | | 2.6 | | 10 | 570 | | 63 | | | | | | | | | | |
| 1458 | | | | 2.5 | | 10 | 569 | | 64 | | | | | | | | | | |
| 1513 | | | | 2.6 | | 10 | 562 | | 62 | | | | | | | | | | |
| 1528 | | | | 2.7 | | 15 | 573 | | 64 | | | | | | | | | | |
| 1543 | | | | 4.4 | | 10 | 574 | | 64 | | | | | | | | | | |
| 1558 | | | | 2.4 | | 10 | 585 | | 62 | | | | | | | | | | |
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032 1/82

# FIELD DATA SHEET

ACUREX Aerotherm

Plant CHEVRON (EER)
Location
Operator BEST
Date 1-26-84
Load Range

Ambient Temperature 58°F
Barometric Pressure 29.54 (1200)
Static Pressure Duct
Fuel LEASE CRUDE

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1523 | | | | 1.1 | | 10 | 609 | | 70 | | | | | | | | | | |
| 1538 | | | | 2.8 | | 10 | 591 | | 73 | | | | | | | | | | |
| 1563 | | | | 2.7 | | 10 | 581 | | 71 | | | | | | | | | | |
| 1608 | | | | 2.8 | | 10 | 573 | | 73 | | | | | | | | | | |
| 1623 | | | | 2.6 | | 10 | 574 | | 71 | | | | | | | | | | |
| 1635 | | | | 2.7 | | 15 | 584 | | 73 | | | | | | | | | | |
| 1705 | | | | 2.7 | | 5 | 616 | | 71 | | | | | | | | | | |
| 1735 | | | | 3.0 | | 0 | 612 | | 69 | | | | | | | | | | |
| 1805 | | | | 2.9 | | 0 | 614 | | 68 | | | | | | | | | | |
| 1835 | | | | 3.0 | | 5 | 625 | | 64 | | | | | | | | | | |
| 1905 | | | | 2.9 | | 0 | 625 | | 69 | | | | | | | | | | |
| 1935 | | | | 2.8 | | 0 | 628 | | 69 | | | | | | | | | | |
| 2005 | | | | 2.8 | | 5 | 626 | | 69 | | | | | | | | | | |
| 2035 | | | | 2.9 | | 5 | 630 | | 69 | | | | | | | | | | |
| 2105 | | | | 2.7 | | 10 | 625 | | 71 | | | | | | | | | | |
| 2135 | | | | 2.8 | | 5 | 615 | | 70 | | | | | | | | | | |
| 2205 | | | | 2.9 | | 5 | 625 | | 70 | | | | | | | | | | |
| 2235 | | | | 3.0 | | 10 | 624 | | 70 | | | | | | | | | | |
| 2305 | | | | 2.8 | | 5 | 624 | | 70 | | | | | | | | | | |
| 2335 | | | | 2.8 | | 5 | 616 | | 68 | | | | | | | | | | |
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# FIELD DATA SHEET

ACUREX Aerotherm

Plant CHEVRON (EER)
Location
Operator BEST
Date 1-27-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel LEASE CRUDE

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0005 | | | | 3.0 | | 5 | 626 | | 65 | | | | | | | | | | |
| 0035 | | | | 2.9 | | 5 | 630 | | 62 | | | | | | | | | | |
| 0105 | | | | 2.9 | | 5 | 637 | | 67 | | | | | | | | | | |
| 0135 | | | | 3.0 | | 5 | 658 | | 65 | | | | | | | | | | |
| 0205 | | | | 2.8 | | 10 | 638 | | 66 | | | | | | | | | | |
| 0235 | | | | 2.9 | | 0 | 650 | | 66 | | | | | | | | | | |
| 0305 | | | | 3.1 | | 5 | 634 | | 62 | | | | | | | | | | |
| 0335 | | | | 3.0 | | 5 | 612 | | 65 | | | | | | | | | | |
| 0405 | | | | 3.0 | | 5 | 621 | | 64 | | | | | | | | | | |
| 0435 | | | | 3.2 | | 10 | 621 | | 18 | | | | | | | | | | |
| 0505 | | | | 2.9 | | 10 | 623 | | 68 | | | | | | | | | | |
| 0535 | | | | 2.8 | | 5 | 617 | | 64 | | | | | | | | | | |
| 0605 | | | | 3.1 | | 10 | 623 | | 61 | | | | | | | | | | |
| 0635 | | | | 3.3 | | 10 | 621 | | 29 | | | | | | | | | | |
| 0705 | | | | 3.2 | | 10 | 622 | | 33 | | | | | | | | | | |
| 0735 | | | | 2.9 | | 10 | 621 | | 61 | | | | | | | | | | |
| 0805 | | | | 2.9 | | 10 | 611 | | 60 | | | | | | | | | | |
| 0849 | | | | 2.7 | | 15 | 573 | | 70 | | | | | | | | | | |
| 0849 | | | | 2.6 | | 15 | 612 | | 69 | | | | | | | | | | |
| 0904 | | | | 2.7 | | 10 | 612 | | 71 | | | | | | | | | | |
| 0919 | | | | 2.7 | | 15 | 603 | | 67 | | | | | | | | | | |
| 0934 | | | | 2.7 | | 15 | 590 | | 69 | | | | | | | | | | |
| 0949 | | | | 2.8 | | 20 | 622 | | 68 | | | | | | | | | | |
| 1004 | | | | 2.9 | | 20 | 550 | | 66 | | | | | | | | | | |
| 1019 | | | | 2.8 | | 25 | 549 | | 66 | | | | | | | | | | |
| 1034 | | | | 2.7 | | 25 | 577 | | 64 | | | | | | | | | | AVERAGE |
| 1049 | | | | 2.8 | | 25 | 568 | | 63 | | | | | | | | | | |
| 1104 | | | | 2.7 | | 20 | 575 | | 60 | | | | | | | | | | |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant

Location

Operator

Date 1-27-84 (CONTINUED)

Load Range

Ambient Temperature

Barometric Pressure

Static Pressure Duct

Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1119 | | | | 2.9 | | 25 | 569 | | 61 | | | | | | | | | | |
| 1134 | | | | 2.8 | | 25 | 569 | | 59 | | | | | | | | | | |
| 1149 | | | | 2.7 | | 25 | 574 | | 58 | | | | | | | | | | |
| 1204 | | | | 2.8 | | 25 | 539 | | 56 | | | | | | | | | | |
| 1219 | | | | 2.7 | | 30 | 539 | | 57 | | | | | | | | | | |
| 1234 | | | | 2.6 | | 25 | 536 | | 58 | | | | | | | | | | |
| 1249 | | | | 2.7 | | 25 | 546 | | 71 | | | | | | | | | | |
| 1304 | | | | 4.5 | | 25 | 530 | | 65 | | | | | | | | | | |
| 1319 | | | | 4.4 | | 25 | 538 | | 64 | | | | | | | | | | |
| 1334 | | | | 4.4 | | 20 | 556 | | 62 | | | | | | | | | | |
| 1349 | | | | 0 | | 25 | 549 | | 27 | | | | | | | | | | |
| 1404 | | | | 3.0 | | 20 | 551 | | 62 | | | | | | | | | | |
| 1419 | | | | 3.3 | | 20 | 547 | | 63 | | | | | | | | | | |
| 1434 | | | | 0.6 | | 20 | 549 | | 52 | | | | | | | | | | |
| 1504 | | | | 3.0 | | 20 | 555 | | 66 | | | | | | | | | | |
| 1519 | | | | 4.4 | | 20 | 531 | | 67 | | | | | | | | | | |
| 1534 | | | | 4.4 | | 20 | 563 | | 67 | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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ACUREX Aerotherm

# FIELD DATA SHEET

Plant CHEVRON (EER)
Location SVS-69
Operator BEST
Date 1-28-84
Load Range

Ambient Temperature 67°F 56°F
Barometric Pressure 29.42 (1200) 29.32 (2200)
Static Pressure Duct
Fuel LEASE CRUDE

|  |  |  |  | DRY UNCORRECTED |  |  |  |  |  |  | CORRECTED TO 3% O2 DRY |  |  | HYDROCARBONS (HC) |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1204 |  |  |  | 2.7 |  | 25 | 584 |  | 75 |  |  |  |  |  |  |  |  |  |  |
| 1219 |  |  |  | 2.7 |  | 25 | 574 |  | 75 |  |  |  |  |  |  |  |  |  |  |
| 1234 |  |  |  | 2.8 |  | 25 | 557 |  | 78 |  |  |  |  |  |  |  |  |  |  |
| 1249 |  |  |  | 2.9 |  | 20 | 553 |  | 77 |  |  |  |  |  |  |  |  |  |  |
| 1804 |  |  |  | 2.9 |  | 20 | 556 |  | 77 |  |  |  |  |  |  |  |  |  |  |
| 1319 |  |  |  | 2.9 |  | 15 | 567 |  | 77 |  |  |  |  |  |  |  |  |  |  |
| 1334 |  |  |  | 2.9 |  | 10 | 567 |  | 76 |  |  |  |  |  |  |  |  |  |  |
| 1349 |  |  |  | 2.9 |  | 15 | 566 |  | 76 |  |  |  |  |  |  |  |  |  |  |
| 1404 |  |  |  | 2.8 |  | 15 | 567 |  | 77 |  |  |  |  |  |  |  |  |  |  |
| 1419 |  |  |  | 2.8 |  | 15 | 569 |  | 74 |  |  |  |  |  |  |  |  |  |  |
| 1434 |  |  |  | 2.8 |  | 20 | 576 |  | 74 |  |  |  |  |  |  |  |  |  |  |
| 1449 |  |  |  | 2.7 |  | 20 | 581 |  | 78 |  |  |  |  |  |  |  |  |  |  |
| 1504 |  |  |  | 2.9 |  | 15 | 573 |  | 79 |  |  |  |  |  |  |  |  |  |  |
| 1519 |  |  |  | 2.9 |  | 10 | 581 |  | 77 |  |  |  |  |  |  |  |  |  |  |
| 1534 |  |  |  | 3.0 |  | 15 | 628 |  | 73 |  |  |  |  |  |  |  |  |  |  |
| 1549 |  |  |  | 2.9 |  | 10 | 579 |  | 81 |  |  |  |  |  |  |  |  |  |  |
| 1604 |  |  |  | 2.8 |  | 10 | 583 |  | 79 |  |  |  |  |  |  |  |  |  |  |
| 1619 |  |  |  | 2.8 |  | 10 | 585 |  | 78 |  |  |  |  |  |  |  |  |  |  |
| 1634 |  |  |  | 2.9 |  | 10 | 587 |  | 78 |  |  |  |  |  |  |  |  |  |  |
| 1649 |  |  |  | 3.0 |  | 5 | 598 |  | 77 |  |  |  |  |  |  |  |  |  |  |
| 1707 |  |  |  | 2.9 |  | 15 | 593 |  | 82 |  |  |  |  |  |  |  |  |  |  |
| 1719 |  |  |  | 2.8 |  | 20 | 595 |  | 79 |  |  |  |  |  |  |  |  |  |  |
| 1734 |  |  |  | 2.9 |  | 20 | 587 |  | 80 |  |  |  |  |  |  |  |  |  |  |
| 1749 |  |  |  | 2.9 |  | 20 | 588 |  | 81 |  |  |  |  |  |  |  |  |  |  |
| 1804 |  |  |  | 2.9 |  | 20 | 595 |  | 83 |  |  |  |  |  |  |  |  |  |  |
| 1819 |  |  |  | 2.9 |  | 15 | 598 |  | 84 |  |  |  |  |  |  |  |  |  | AVERAGE |
| 1834 |  |  |  | 2.6 |  | 15 | 616 |  | 83 |  |  |  |  |  |  |  |  |  |  |
| 1849 |  |  |  | 3.0 |  | 10 | 613 |  | 76 |  |  |  |  |  |  |  |  |  |  |

032 1/82

**ACUREX Aerotherm**

# FIELD DATA SHEET

Plant

Location

Operator

Date 1-28-84 (CONTINUED)

Load Range

Ambient Temperature

Barometric Pressure

Static Pressure Duct

Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1904 | | | | 2.9 | | 10 | 600 | | 78 | | | | | | | | | | |
| 1919 | | | | 2.9 | | - | 598 | | 77 | | | | | | | | | | |
| 1934 | | | | 3.0 | | - | 593 | | 75 | | | | | | | | | | |
| 1949 | | | | 3.0 | | - | 589 | | 76 | | | | | | | | | | |
| 2004 | | | | 2.9 | | - | 583 | | 74 | | | | | | | | | | |
| 2019 | | | | 2.8 | | - | 581 | | 72 | | | | | | | | | | |
| 2034 | | | | 2.7 | | - | 577 | | 72 | | | | | | | | | | |
| 2049 | | | | 2.8 | | - | 573 | | 71 | | | | | | | | | | |
| 2104 | | | | 2.7 | | - | 550 | | 70 | | | | | | | | | | |
| 2119 | | | | 2.8 | | - | 556 | | 74 | | | | | | | | | | |
| 2134 | | | | 2.8 | | - | 556 | | 74 | | | | | | | | | | |
| 2149 | | | | 2.9 | | - | 558 | | 72 | | | | | | | | | | |
| 2249 | | | | 2.8 | | 25 | 586 | | 80 | | | | | | | | | | |
| 2304 | | | | 2.8 | | 25 | 580 | | 78 | | | | | | | | | | |
| 2319 | | | | 2.8 | | 30 | 579 | | 80 | | | | | | | | | | |
| 2334 | | | | 2.9 | | 30 | 576 | | 77 | | | | | | | | | | |
| 2349 | | | | 2.9 | | 30 | 568 | | 79 | | | | | | | | | | |
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032 1/82

# FIELD DATA SHEET

ACUREX Aerotherm

Plant CHEVRON (EER)
Location SVS - 69
Operator BEST
Date 1-29-84
Load Range

Ambient Temperature 64°F
Barometric Pressure 29.32 (1020) 29.18 (1950)
Static Pressure Duct
Fuel LEASE CRUDE

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0004 | | | | 2.9 | | 30 | 570 | | 76 | | | | | | | | | | |
| 0019 | | | | 3.0 | | 30 | 565 | | 73 | | | | | | | | | | |
| 0034 | | | | 2.9 | | 30 | 576 | | 70 | | | | | | | | | | |
| 0049 | | | | 2.9 | | 30 | 581 | | 75 | | | | | | | | | | |
| 0101 | | | | 2.9 | | 30 | 589 | | 75 | | | | | | | | | | |
| 0119 | | | | 2.9 | | 35 | 587 | | 72 | | | | | | | | | | |
| 0134 | | | | 2.8 | | 35 | 589 | | 70 | | | | | | | | | | |
| 0149 | | | | 2.9 | | 35 | 686 | | 72 | | | | | | | | | | |
| 0204 | | | | 2.7 | | 40 | 597 | | 71 | | | | | | | | | | |
| 0219 | | | | 2.8 | | 35 | 588 | | 72 | | | | | | | | | | |
| 0234 | | | | 2.9 | | 35 | 591 | | 71 | | | | | | | | | | |
| 0249 | | | | 3.0 | | 35 | 598 | | 72 | | | | | | | | | | |
| 0304 | | | | 2.8 | | 35 | 616 | | 70 | | | | | | | | | | |
| 0319 | | | | 2.5 | | 35 | 610 | | 70 | | | | | | | | | | |
| 0334 | | | | 3.7 | | 40 | 598 | | 71 | | | | | | | | | | |
| 0349 | | | | 2.8 | | 40 | 595 | | 71 | | | | | | | | | | |
| 0404 | | | | 2.9 | | 40 | 593 | | 70 | | | | | | | | | | |
| 0419 | | | | 2.8 | | 40 | 591 | | 73 | | | | | | | | | | |
| 0434 | | | | 2.5 | | 40 | 600 | | 71 | | | | | | | | | | |
| 0449 | | | | 2.9 | | 40 | 584 | | 74 | | | | | | | | | | |
| 0504 | | | | 2.8 | | 45 | 577 | | 76 | | | | | | | | | | |
| 0519 | | | | 2.8 | | 40 | 580 | | 72 | | | | | | | | | | |
| 0534 | | | | 2.8 | | 40 | 573 | | 71 | | | | | | | | | | |
| 0549 | | | | 2.8 | | 40 | 570 | | 68 | | | | | | | | | | |
| 0604 | | | | 2.8 | | 40 | 578 | | 65 | | | | | | | | | | |
| 0619 | | | | 2.7 | | 40 | 589 | | 64 | | | | | | | | | | AVERAGE |
| 0634 | | | | 2.8 | | 40 | 586 | | 67 | | | | | | | | | | |
| 0649 | | | | 3.0 | | 40 | 589 | | 67 | | | | | | | | | | |

# FIELD DATA SHEET

**ACUREX Aerotherm**

Plant
Location
Operator
Date 1-29-84 (CONTINUED)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0704 | | | | 2.9 | | 40 | 588 | | 67 | | | | | | | | | | |
| 0719 | | | | 2.9 | | 40 | 586 | | 69 | | | | | | | | | | |
| 0734 | | | | 2.7 | | 40 | 599 | | 67 | | | | | | | | | | |
| 0749 | | | | 2.7 | | 40 | 594 | | 64 | | | | | | | | | | |
| 0804 | | | | 2.7 | | 40 | 595 | | 63 | | | | | | | | | | |
| 0819 | | | | 2.9 | | 40 | 692 | | 62 | | | | | | | | | | |
| 0834 | | | | 2.8 | | 45 | 581 | | 64 | | | | | | | | | | |
| 0849 | | | | 2.9 | | 40 | 603 | | 64 | | | | | | | | | | |
| 0904 | | | | 2.8 | | 45 | 597 | | 65 | | | | | | | | | | |
| 0919 | | | | 2.9 | | 45 | 576 | | 67 | | | | | | | | | | |
| 0934 | | | | 2.9 | | 40 | 581 | | 64 | | | | | | | | | | |
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ACUREX
Aerotherm

# FIELD DATA SHEET

Plant CHEVRON EOR
Location SVS - 69
Operator BEST
Date 1-30-84
Load Range

Ambient Temperature 58°F
Barometric Pressure 29.42 (0900) 29.30 (1650)
Static Pressure Duct
Fuel LEASE CRUDE

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0000 | | | | | | | | | | | | | | | | | | | All values from |
| 0015 | | | | 3.0 | 12.5 | 8 | 550 | | 61 | | | | | | | | | | Strip Charts |
| 0030 | | | | 2.9 | 12.5 | 8 | 555 | | 61 | | | | | | | | | | |
| 0045 | | | | | 12.5 | 5 | 560 | | | | | | | | | | | | |
| 0100 | | | | | 12.5 | 8 | 565 | | | | | | | | | | | | |
| 0115 | | | | | | 8 | 570 | | Lost Flow ↓ | | | | | | | | | | |
| 0130 | | | | Lost Flow ↓ | | 10 | 575 | | | | | | | | | | | | |
| 0145 | | | | | Lost Flow ↓ | 12 | 580 | | | | | | | | | | | | |
| 0200 | | | | | | 10 | 560 | | | | | | | | | | | | |
| 0215 | | | | | | 10 | 565 | | | | | | | | | | | | |
| 0230 | | | | | | 10 | 565 | | | | | | | | | | | | |
| 0245 | | | | | | 10 | 575 | | | | | | | | | | | | |
| 0300 | | | | | | 10 | 585 | | | | | | | | | | | | |
| 0315 | | | | | | 10 | 590 | | | | | | | | | | | | |
| 0330 | | | | | | 13 | 590 | | | | | | | | | | | | |
| 0345 | | | | | | 13 | 570 | | | | | | | | | | | | |
| 0400 | | | | | | 13 | 580 | | | | | | | | | | | | |
| 0415 | | | | | | 13 | 565 | | | | | | | | | | | | |
| 0430 | | | | | | 13 | 560 | | | | | | | | | | | | |
| 0445 | | | | | | 13 | 555 | | | | | | | | | | | | |
| 0500 | | | | | | 13 | 550 | | | | | | | | | | | | |
| 0515 | | | | | | 13 | 550 | | | | | | | | | | | | |
| 0530 | | | | | | 15 | 555 | | | | | | | | | | | | |
| 0545 | | | | | | 15 | 550 | | | | | | | | | | | | |
| 0600 | | | | | | 15 | Lost Flow | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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032 1/82

# FIELD DATA SHEET

ACUREX Aerotherm

Plant CHEVRON (EER)
Location SVS-69
Operator BEST
Date 1-30-84 (CONTINUED)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0615 | | | | | | 15 | | | | | | | | | | | | | |
| 0630 | | | | LOST FLOW | LOST FLOW | 15 | LOST FLOW | | LOST FLOW | | | | | | | | | | |
| 0645 | | | | | | 15 | | | | | | | | | | | | | |
| 0700 | | | | | | 15 | | | | | | | | | | | | | |
| 0715 | | | | | | 12 | | | | | | | | | | | | | |
| 0730 | | | | | | 14 | | | | | | | | | | | | | |
| 0745 | | | | | | 16 | | | | | | | | | | | | | |
| 0800 | | | | | | 20 | | | | | | | | | | | | | |
| 0815 | | | | | | 23 | | | | | | | | | | | | | |
| 0830 | | | | | | 23 | | | | | | | | | | | | | |
| 0845 | | | | | | 24 | | | | | | | | | | | | | |
| 0900 | | | | | | 25 | | | | | | | | | | | | | |
| 0915 | | | | | | 25 | | | | | | | | | | | | | |
| 0930 | | | | | | 25 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 0930 INTERNAL CAL |
| | | | | 0.0 | +0.2 | +15 | +5 | | 0 | | | | | | | | | | ZERO |
| | | | | 6.8 | 18.0 | 175 | 505 | | 90 | | | | | | | | | | SPAN |
| | | | | | 17.8 | | 533 | | 90 | | | | | | | | | | SPAN GAS VALUE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | LEAK CHECK OK |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | UNIT HAD TROUBLE |
| | | | | | | | | | | | | | | | | | | | RUNNING WITH |
| | | | | | | | | | | | | | | | | | | | AUTOMATIC CONTROLS |
| | | | | | | | | | | | | | | | | | | | DELAY UNTIL 1530 |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant: CHEVRON (EER)
Location: SUS -69
Operator: BEST
Date: 1-30-84 (CONTINUED)
Load Range:

Ambient Temperature:
Barometric Pressure:
Static Pressure Duct:
Fuel:

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1620 | START | | | 3.4 | 13.2 | 25 | 505 | | 64 | | | | | | | | | | RECALIBRATE 1540 |
| 1630 | | | | 3.5 | 13.2 | 25 | 505 | | 65 | | | | | | | | | 1160 | START TEST AT 1620. |
| 1645 | | | | 3.7 | 13.2 | 25 | 505 | | 65 | | | | | | | | | | |
| 1700 | | | | 3.7 | 13.2 | 25 | 500 | | 65 | | | | | | | | | | CO VERY NOISY |
| 1715 | | | | 3.7 | 13.2 | 25 | 500 | | 63 | | | | | | | | | | |
| 1730 | | | | 3.7 | 13.3 | 25 | 500 | | 62 | | | | | | | | | | |
| 1745 | | | | 3.7 | 13.4 | 25 | 500 | | 62 | | | | | | | | | | |
| 1800 | | | | 3.7 | 13.3 | 25 | 505 | | 62 | | | | | | | | | | |
| 1815 | | | | 3.6 | 13.3 | 25 | 510 | | 62 | | | | | | | | | | |
| 1830 | | | | 3.6 | 13.4 | 25 | 510 | | 63 | | | | | | | | | | |
| 1845 | | | | 3.7 | 13.5 | 25 | 515 | | 64 | | | | | | | | | | |
| 1900 | | | | 3.7 | 13.6 | 25 | 515 | | 66 | | | | | | | | | | |
| 1915 | | | | 3.7 | 13.5 | 25 | 520 | | 67 | | | | | | | | | | |
| 1930 | | | | 3.7 | 13.4 | 25 | 520 | | 67 | | | | | | | | | | |
| 1945 | | | | 3.7 | LOST FLOW ↓ | 25 | 520 | | 68 | | | | | | | | | | |
| 2000 | | | | 3.7 | | 25 | 520 | | 69 | | | | | | | | | | |
| 2015 | | | | 3.6 | | 25 | 520 | | 70 | | | | | | | | | | |
| 2030 | | | | 3.5 | | 25 | 520 | | 70 | | | | | | | | | | |
| 2045 | | | | 3.6 | | 25 | 520 | | 67 | | | | | | | | | | |
| 2100 | | | | 3.6 | | 25 | 520 | | 62 | | | | | | | | | | |
| 2115 | | | | 3.5 | | 25 | 520 | | 67 | | | | | | | | | | |
| 2130 | | | | 3.5 | | 25 | 520 | | 68 | | | | | | | | | | |
| 2145 | | | | 3.7 | | 25 | 523 | | 68 | | | | | | | | | | |
| 2200 | | | | 3.6 | | 25 | 523 | | 68 | | | | | | | | | | |
| 2215 | | | | 3.6 | | 25 | 522 | | 65 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chavron (EER)
Location SVS - 69
Operator Best
Date 1-30-84 (continued)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 2230 | | | | 3.6 | | 25 | 523 | | 63 | | | | | | | | | | |
| 2245 | | | | 3.6 | LOW FLOW | 25 | 525 | | 64 | | | | | | | | | | |
| 2300 | | | | 3.5 | | 25 | 530 | | 64 | | | | | | | | | | |
| 2315 | | | | 3.5 | | 25 | 530 | | 65 | | | | | | | | | | |
| 2330 | | | | 3.5 | | 25 | 533 | | 65 | | | | | | | | | | |
| 2345 | | | | 3.6 | | 25 | 535 | | 65 | | | | | | | | | | |
| 2400 | | | | 3.6 | | 25 | 538 | | 64 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

# FIELD DATA SHEET

**ACUREX Aerotherm**

Plant Chevron (EER)
Location SVS-69
Operator Bert
Date 1-31-84
Load Range

Ambient Temperature 66 °F
Barometric Pressure 29.34 (1800)
Static Pressure Duct
Fuel Lease crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0015 | | | | 3.5 | lost flow | 30 | 538 | | 63 | | | | | | | | | | All values from |
| 0030 | | | | 3.5 | | 30 | 538 | | 63 | | | | | | | | | | strip charts |
| 0045 | | | | 3.5 | | 30 | 538 | | 63 | | | | | | | | | | |
| 0100 | | | | 3.5 | | 30 | 538 | | lost flow | | | | | | | | | | |
| 0115 | | | | lost flow | | 30 | 538 | | | | | | | | | | | | |
| 0130 | | | | | | 30 | 538 | | | | | | | | | | | | |
| 0145 | | | | | | 30 | 538 | | | | | | | | | | | | |
| 0200 | | | | | | 30 | 538 | | | | | | | | | | | | |
| 0215 | | | | | | 30 | 538 | | | | | | | | | | | | |
| 0230 | | | | | | 30 | 538 | | | | | | | | | | | | |
| 0245 | | | | | | 30 | 538 | | | | | | | | | | | | |
| 0300 | | | | | | 30 | 538 | | | | | | | | | | | | |
| 0315 | | | | | | 30 | 540 | | | | | | | | | | | | |
| 0330 | | | | | | 30 | 540 | | | | | | | | | | | | |
| 0345 | | | | | | 30 | 540 | | | | | | | | | | | | |
| 0400 | | | | | | 30 | 540 | | | | | | | | | | | | |
| 0415 | | | | | | 30 | 544 | | | | | | | | | | | | |
| 0430 | | | | | | 30 | 545 | | | | | | | | | | | | |
| 0445 | | | | | | 30 | 542 | | | | | | | | | | | | |
| 0500 | | | | | | 30 | 542 | | | | | | | | | | | | |
| | | | | ↓ | ↓ | | | | ↓ | | | | | | | | | | Power failure ~0520 |
| | | | | | | | | | | | | | | | | | | | no final cal |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

032 1/82

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)
Location SVS-69
Operator Best
Date 1-31-84 (Cont)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1800 | Start | | | | 14.3 | 15 | 573 | | 72 | | | | | | | | | | Electrical problem in |
| 1815 | | | | | 14.0 | 15 | 573 | | 72 | | | | | | | | | | unit not fired until |
| 1830 | | | | | 14.0 | 15 | 573 | | 72 | | | | | | | | | | late afternoon |
| 1845 | | | | | 13.8 | 15 | 573 | | 72 | | | | | | | | | | |
| 1900 | | | | | 13.5 | 15 | 573 | | 71 | | | | | | | | | | Calibrated at 1740 |
| 1915 | | | | | 13.4 | 15 | 573 | | 71 | | | | | | | | | | |
| 1930 | | | | | 13.4 | 15 | 573 | | 72 | | | | | | | | | | CO strip chart left |
| 1945 | | | | | 13.3 | 15 | 575 | | 73 | | | | | | | | | | on 2 cm/min |
| 2000 | | | | | 13.2 | 15 | 580 | | 74 | | | | | | | | | | |
| 2015 | | | | | 13.2 | 15 | 580 | | 74 | | | | | | | | | | CO cycles between |
| 2030 | | | | | 13.2 | 15 | 580 | | 74 | | | | | | | | | | 0 & 30 ppm |
| 2045 | | | | | 13.2 | 15 | 580 | | 73 | | | | | | | | | | |
| 2100 | | | | | 13.2 | 15 | 580 | | 75 | | | | | | | | | | |
| 2115 | | | | | 13. | 15 | 580 | | 76 | | | | | | | | | | |
| 2130 | | | | | 13. | 15 | 580 | | 75 | | | | | | | | | | |
| 2145 | | | | | 13.1 | 15 | 580 | | 71 | | | | | | | | | | |
| 2200 | | | | | 13.1 | 15 | 580 | | 71 | | | | | | | | | | |
| 2215 | | | | | 13.1 | 15 | 585 | | 72 | | | | | | | | | | |
| 2230 | | | | | 13.1 | 15 | 590 | | 73 | | | | | | | | | | |
| 2245 | | | | | 13.1 | 15 | 590 | | 72 | | | | | | | | | | |
| 2300 | | | | | 13.1 | 15 | 590 | | 70 | | | | | | | | | | |
| 2315 | | | | | 13.1 | 15 | 590 | | 69 | | | | | | | | | | |
| 2330 | | | | | 13.1 | 15 | 590 | | 69 | | | | | | | | | | |
| 2345 | | | | | 13.1 | 15 | 590 | | 71 | | | | | | | | | | |
| 2400 | | | | | 13.1 | 15 | 573 | | 71 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

# FIELD DATA SHEET

Plant Chevron (EER)
Location SVS-69
Operator Best
Date 2-1-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel lease crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0009 | | | | 2.8 | 13.2 | 9 | 583 | | 72 | | | | | | | | | | From Autodata 10 |
| 0024 | | | | 2.7 | 13.3 | 6 | 587 | | 72 | | | | | | | | | | |
| 0038 | | | | 2.8 | 13.1 | 14 | 589 | | 69 | | | | | | | | | | |
| 0053 | | | | 2.8 | 13.3 | 15 | 587 | | 71 | | | | | | | | | | |
| 0105 | | | | 2.7 | 13.3 | 16 | 581 | | 72 | | | | | | | | | | |
| 0121 | | | | 2.7 | 13.3 | 14 | 591 | | 71 | | | | | | | | | | |
| 0139 | | | | 2.8 | 13.2 | 14 | 585 | | 74 | | | | | | | | | | |
| 0202 | | | | 2.7 | 13.2 | 14 | 589 | | 72 | | | | | | | | | | |
| 0219 | | | | 2.8 | 13.3 | 13 | 586 | | 74 | | | | | | | | | | |
| 0242 | | | | 2.8 | 13.2 | 13 | 588 | | 73 | | | | | | | | | | |
| 0302 | | | | 2.8 | 13.3 | 14 | 587 | | 72 | | | | | | | | | | |
| 0322 | | | | 2.8 | 13.2 | 15 | 586 | | 73 | | | | | | | | | | |
| 0337 | | | | 2.7 | 13.2 | 7 | 678 | | 69 | | | | | | | | | | |
| 0350 | | | | 2.7 | 13.3 | 14 | 578 | | 71 | | | | | | | | | | |
| 0404 | | | | 2.7 | 13.3 | 15 | 567 | | 70 | | | | | | | | | | |
| 0413 | | | | 2.6 | 13.4 | 15 | 574 | | 71 | | | | | | | | | | |
| 0428 | | | | 2.7 | 13.2 | 15 | 579 | | 71 | | | | | | | | | | |
| 0443 | | | | 2.8 | 13.2 | 13 | 574 | | 73 | | | | | | | | | | |
| 0501 | | | | 2.8 | 13.2 | 14 | 578 | | 72 | | | | | | | | | | |
| 0508 | | | | 2.8 | 13.2 | 14 | 575 | | 72 | | | | | | | | | | |
| 0523 | | | | 2.8 | 13.2 | 13 | 581 | | 71 | | | | | | | | | | |
| 0538 | | | | 2.8 | 13.2 | 13 | 587 | | 69 | | | | | | | | | | |
| 0602 | | | | 2.7 | 13.2 | 11 | 583 | | 72 | | | | | | | | | | |
| 0617 | | | | 2.8 | 13.2 | 11 | 576 | | 73 | | | | | | | | | | |
| 0629 | | | | 2.8 | 13.2 | 14 | 581 | | 73 | | | | | | | | | | AVERAGE |
| 0644 | | | | 2.7 | 13.2 | 11 | 576 | | 72 | | | | | | | | | | |
| 0659 | | | | 2.8 | 13.2 | 13 | 574 | | 74 | | | | | | | | | | |
| 0714 | | | | 2.7 | 145 | 15 | 578 | | 76 | | | | | | | | | | |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)
Location SVS-69
Operator Best
Date 2-1-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0720 | | | | | | | | | | | | | | | | | | | calibrate 0720 |
| | | | | | | | | | | | | | | | | | | | internal |
| | | | | 0.0 | 0.0 | -7 | 0 | | -1.5 | | | | | | | | | | zero |
| | | | | 7.35 | 18.3 | 182 | 533 | | 92 | | | | | | | | | | span |
| | | | | 7.1 | | | 533 | | 90 | | | | | | | | | | span gas |
| | | | | | | | | | | | | | | | | | | | |
| 0759 | | | | 2.7 | 14.3 | 25 | 594 | | 68 | | | | | | | | | | |
| 0814 | | | | 2.9 | 14.1 | 24 | 555 | | 70 | | | | | | | | | | |
| 0828 | | | | 3.0 | 13.8 | 25 | 551 | | 69 | | | | | | | | | | |
| 0843 | | | | 3.5 | 13.1 | 20 | 531 | | 71 | | | | | | | | | | |
| 0901 | | | | 2.4 | 13.5 | 43 | 564 | | 80 | | | | | | | | | | |
| 0914 | | | | 2.5 | 13.1 | 25 | 574 | | 75 | | | | | | | | | | |
| 0928 | | | | 2.5 | 12.7 | 24 | 572 | | 77 | | | | | | | | | | |
| 09[illegible] | | | | | 13.7 | 28 | | | 74 | | | | | | | | | | |
| 1000 | | | | 2.2 | 13.2 | 23 | 594 | | 71 | | | | | | | | | | |
| 1015 | | | | 2.9 | 13.7 | 23 | 566 | | 70 | | | | | | | | | | |
| 1038 | | | | 2.3 | 14.0 | 23 | 591 | | 69 | | | | | | | | | | |
| 1053 | | | | 2.7 | 13.5 | 21 | 571 | | 70 | | | | | | | | | | |
| 1108 | | | | 2.7 | 12.8 | 24 | 567 | | 70 | | | | | | | | | | |
| 1122 | | | | 2.6 | 12.6 | 26 | 569 | | 71 | | | | | | | | | | M5/8 1, SASS start |
| 1136 | | | | 2.7 | 12.2 | 22 | 569 | | 70 | | | | | | | | | | |
| 1143 | | | | 2.7 | 12.2 | 23 | 569 | | 70 | | | | | | | | | | |
| 1157 | | | | 2.7 | 12.6 | 24 | 563 | | 68 | | | | | | | | | | |
| 1218 | | | | 2.8 | 13.3 | 25 | 563 | | 68 | | | | | | | | | | |
| 1233 | | | | 2.7 | 12.7 | 26 | 561 | | 68 | | | | | | | | | | |
| 1246 | | | | 2.8 | 12.5 | 22 | 566 | | 67 | | | | | | | | | | M5/8 AVERAGE stop |
| 1305 | | | | 2.8 | 13.3 | 24 | 566 | | 68 | | | | | | | | | | |
| 1322 | | | | 2.8 | 12.9 | 23 | 561 | | 67 | | | | | | | | | | |

032 1/82

# FIELD DATA SHEET

**ACUREX Aerotherm**

Plant Chevron EER
Location SVS-69
Operator Best
Date 2-1-84 (cont.)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1335 | | | | 2.7 | 13.6 | 24 | 560 | | 72 | | | | | | | | | | |
| 1354 | | | | 2.7 | 13.4 | 24 | 553 | | 73 | | | | | | | | | | |
| 1407 | | | | 2.8 | 13.5 | 24 | 550 | | 75 | | | | | | | | | | |
| 1423 | | | | 2.7 | 13.1 | 21 | 560 | | 75 | | | | | | | | | | |
| 1437 | | | | 2.3 | 13.6 | 21 | 589 | | 71 | | | | | | | | | | |
| 1455 | | | | 2.8 | 13.4 | 25 | 569 | | 67 | | | | | | | | | | |
| 1510 | | | | 2.8 | 13.5 | 27 | 569 | | 68 | | | | | | | | | | |
| 1525 | | | | 2.7 | 13.7 | 26 | 559 | | 68 | | | | | | | | | | |
| 1540 | | | | 2.7 | 13.3 | 27 | 558 | | 68 | | | | | | | | | | |
| 1555 | | | | 2.5 | 134 | 26 | 573 | | 71 | | | | | | | | | | |
| 1610 | | | | 2.7 | 12.9 | 26 | 567 | | 75 | | | | | | | | | | |
| 1625 | | | | 2.7 | 12.9 | 22 | 579 | | 66 | | | | | | | | | | SASS stop |
| | | | | | | | | | | | | | | | | | | | 1636 cal external |
| | | | | 0.0 | 0.0 | +1 | +1 | | -2 | | | | | | | | | | zero |
| | | | | 7.1 | 18.0 | 200 | 538 | | 90 | | | | | | | | | | span |
| | | | | | | | | | 90 | | | | | | | | | | span gas value |
| | | | | | | | | | | | | | | | | | | | recal 1650 |
| | | | | | | | | | | | | | | | | | | | |
| 1200 | start | | | | | | | | | | | | | | | | | | |
| 1710 | | | | 2.6 | 14.5 | 22 | 622 | | 71 | | | | | | | | | | |
| 1725 | | | | 2.6 | 14.2 | 19 | 577 | | 71 | | | | | | | | | 483 | |
| 1740 | | | | 2.6 | 13.9 | 20 | 595 | | 73 | | | | | | | | | | |
| 1755 | | | | 2.6 | 139 | 22 | 597 | | 74 | | | | | | | | | 485 | |
| 1810 | | | | 2.6 | 14.0 | 25 | 572 | | 74 | | | | | | | | | 484 | |
| 1825 | | | | 2.6 | 13.6 | 29 | 598 | | 74 | | | | | | | | | 485 | |
| 1840 | | | | 2.6 | 14.0 | 22 | 590 | | 74 | | | | | | | | | 485 | AVERAGE |
| 1855 | | | | 2.3 | 14.0 | 20 | 610 | | 73 | | | | | | | | | | |
| 1910 | | | | 2.8 | 143 | 20 | 582 | | 69 | | | | | | | | | | |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)
Location @ SVS-69
Operator Best
Date 2-1-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1925 | | | | 2.4 | 14.2 | 23 | 578 | | 71 | | | | | | | | | 484 | |
| 1940 | | | | 2.4 | 14.8 | 22 | 587 | | 69 | | | | | | | | | | MSR 2 start |
| 1955 | | | | 2.7 | 13.9 | 25 | 581 | | 70 | | | | | | | | | 483 | |
| 2010 | | | | 2.8 | 13.6 | 23 | 589 | | 77 | | | | | | | | | | |
| 2025 | | | | 3.2 | 13.2 | 22 | 568 | | 72 | | | | | | | | | 494 | |
| 2040 | | | | 2.6 | 14.3 | 26 | 578 | | 74 | | | | | | | | | | |
| 2055 | | | | 2.9 | 13.5 | 24 | 584 | | 74 | | | | | | | | | 492 | |
| 2110 | | | | 2.6 | 13.3 | 23 | 585 | | 73 | | | | | | | | | | |
| 2125 | | | | 2.7 | 13.3 | 24 | 570 | | 76 | | | | | | | | | 487 | |
| 2140 | | | | 2.6 | 13.2 | 22 | 572 | | 82 | | | | | | | | | | MSR 2 stop |
| 2155 | | | | * | 13.3 | 23 | 594 | | 76 | | | | | | | | | 477 | *$O_2$ high due to |
| 2210 | | | | 2.6 | 14.4 | 19 | 574 | | 87 | | | | | | | | | | filter removal |
| 2225 | | | | 2.7 | 14.1 | 23 | 573 | | 81 | | | | | | | | | 466 | |
| 2240 | | | | 2.7 | 13.6 | 22 | 570 | | 80 | | | | | | | | | | |
| 2255 | | | | 2.7 | 13.2 | 21 | 576 | | 79 | | | | | | | | | 464 | |
| 2310 | | | | 2.8 | 13.1 | 26 | 569 | | 81 | | | | | | | | | | |
| 2325 | | | | 2.6 | 12.9 | 22 | 574 | | 80 | | | | | | | | | 464 | → $CO_2$ flow loss |
| 2340 | | | | 2.7 | 12.8 | 21 | 569 | | 78 | | | | | | | | | | |
| 2355 | | | | 2.6 | 12.7 | 25 | 567 | | 76 | | | | | | | | | 463 | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

# FIELD DATA SHEET

**ACUREX Aerotherm**

Plant Chevron (EER)
Location SVS-69 Outlet
Operator Best
Date 2-2-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel lease crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0010 | | | | 2.6 | 128 | 23 | 578 | | 75 | | | | | | | | | | all values from |
| 0025 | | | | 2.7 | 12.7 | 22 | 579 | | 76 | | | | | | | | | 461 | autodata 10 |
| 0040 | | | | 2.7 | 12.7 | 25 | 583 | | 77 | | | | | | | | | | |
| 0055 | | | | 2.7 | 12.6 | 23 | 586 | | 78 | | | | | | | | | 461 | |
| 0110 | | | | 2.7 | 126 | 23 | 586 | | * | | | | | | | | | | |
| 0125 | | | | 2.7 | 12.6 | 23 | 598 | | 82 | | | | | | | | | 466 | |
| 0140 | | | | 2.5 | 12.0 | 24 | 597 | | 80 | | | | | | | | | | |
| 0155 | | | | 2.6 | 12.5 | 23 | 590 | | 80 | | | | | | | | | 468 | |
| 0210 | | | | 2.7 | 12.5 | 23 | 598 | | | | | | | | | | | | |
| 0225 | | | | 2.7 | 12.5 | 24 | 597 | | lost flow | | | | | | | | | 468 | |
| 0240 | | | | 2.7 | 12.5 | 21 | 601 | | | | | | | | | | | | |
| 0255 | | | | 2.8 | lost flow | 22 | 604 | | | | | | | | | | | 469 | |
| 0310 | | | | 2.7 | | 23 | 602 | | | | | | | | | | | | |
| 0325 | | | | 2.7 | | 27 | 601 | | | | | | | | | | | 469 | |
| 0340 | | | | 2.7 | | | 590 | | | | | | | | | | | | |
| 0355 | | | | 2.7 | | 23 | 579 | | | | | | | | | | | 469 | |
| 0410 | | | | 2.7 | | 24 | 590 | | | | | | | | | | | | |
| 0425 | | | | 2.7 | | 24 | 591 | | | | | | | | | | | 468 | |
| 0440 | | | | lost flow | | 23 | 595 | | | | | | | | | | | | |
| 0455 | | | | | | 23 | 588 | | | | | | | | | | | 469 | |
| 0510 | | | | | | 25 | 593 | | | | | | | | | | | | |
| 0525 | | | | | | 23 | 591 | | | | | | | | | | | 469 | |
| 0540 | | | | | | 22 | 601 | | | | | | | | | | | | |
| 0555 | | | | | | 22 | 573 | | | | | | | | | | | 471 | |
| 0610 | | | | | | 22 | 599 | | | | | | | | | | | | |
| 0625 | | | | | ↓ | 23 | 594 | | | | | | | | | | | 469 | AVERAGE |
| 0640 | | | | | | 24 | 596 | | ↓ | | | | | | | | | | |
| 0655 | | | | ↓ | | 22 | 588 | | | | | | | | | | | 468 | |

# FIELD DATA SHEET

ACUREX Aerotherm

Plant
Location
Operator
Date 2-2-84 (cont)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0710 | | | | | | 25 | 588 | | | | | | | | | | | | |
| 0725 | | | | | | 22 | 598 | | | | | | | | | | | 468 | |
| 0740 | | | | | | 21 | 611 | | | | | | | | | | | | |
| 0755 | | | | | | 21 | 607 | | | | | | | | | | | 466 | |
| 0810 | | | | | | 20 | 594 | | | | | | | | | | | | |
| 0825 | | | | | | 23 | 598 | | | | | | | | | | | 456 | |
| 0840 | | | | | | 21 | 593 | | | | | | | | | | | | |
| 0855 | | | | 2.8 | 12.0 | 20 | 590 | | 66 | | | | | | | | | 462 | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 0900 cal external |
| | | | | 0.0 | 0.0 | +6.5 | +0.5 | | 0 | | | | | | | | | | zero |
| | | | | 7.25 | 17.9 | 185 | 545 | | 89.5 | | | | | | | | | | span |
| | | | | | | | | | | | | | | | | | | | span gas |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | recalibrate |
| | | | | | | | | | | | | | | | | | | | leak check okay |
| 0940 | | | | 2.5 | 13.9 | 20 | 612 | | 84 | | | | | | | | | | |
| 0955 | | | | 2.6 | 13.7 | 24 | 589 | | 85 | | | | | | | | | 467 | |
| 1010 | | | | 2.5 | 13.6 | 20 | 587 | | 84 | | | | | | | | | | |
| 1025 | | | | 2.6 | 13.8 | 23 | 579 | | 84 | | | | | | | | | 464 | |
| 1040 | | | | 2.6 | 13.4 | 21 | 579 | | 86 | | | | | | | | | | |
| 1055 | | | | 2.6 | 13.6 | 21 | 574 | | 85 | | | | | | | | | 467 | |
| 1110 | | | | 2.6 | 13.2 | 23 | 579 | | 84 | | | | | | | | | | |
| 1125 | | | | 2.4 | 13.4 | 20 | 586 | | 77 | | | | | | | | | 477 | |
| 1140 | | | | 2.7 | 13.4 | 20 | 585 | | 72 | | | | | | | | | | |
| 1155 | | | | 2.5 | 13.2 | 23 | 583 | | 69 | | | | | | | | | 492 | AVERAGE |
| 1210 | | | | 2.8 | 12.1 | 19 | 573 | | 67 | | | | | | | | | | |
| 1225 | | | | 2.4 | 12.9 | 21 | 581 | | 67 | | | | | | | | | 497 | |

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ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-2-84 (cont.)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1240 | | | | 2.7 | 12.9 | 21 | 573 | | 68 | | | | | | | | | | |
| 1255 | | | | 2.7 | 13.5 | 18 | 576 | | 69 | | | | | | | | | 496 | |
| 1310 | | | | 2.7 | 13.3 | 23 | 577 | | 67 | | | | | | | | | | |
| 1325 | | | | 2.6 | 13.2 | 23 | 567 | | 66 | | | | | | | | | 495 | |
| 1340 | | | | 2.8 | 12.9 | 18 | 566 | | 68 | | | | | | | | | | |
| 1355 | | | | 2.6 | 13.4 | 21 | 578 | | 68 | | | | | | | | | 498 | |
| 1410 | | | | 2.6 | 12.9 | 21 | 568 | | 69 | | | | | | | | | | |
| 1425 | | | | 2.6 | 13.2 | 20 | 568 | | 67 | | | | | | | | | 498 | |
| 1440 | | | | 2.7 | 13.7 | 22 | 563 | | 65 | | | | | | | | | | |
| 1455 | | | | 2.6 | 15.4 | 19 | 567 | | 69 | | | | | | | | | 495 | |
| 1510 | | | | 2.6 | 13.1 | 21 | 568 | | 68 | | | | | | | | | | |
| 1525 | | | | 2.6 | 13.2 | 21 | 567 | | 70 | | | | | | | | | 498 | |
| 1540 | | | | 2.6 | 13.4 | 21 | 564 | | 69 | | | | | | | | | | |
| 1655 | | | | 2.6 | 13.2 | 21 | 562 | | 68 | | | | | | | | | 496 | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 1600 internal cal |
| | | | | 0.0 | -0.1 | +7 | +9 | | 0 | | | | | | | | | | zero |
| | | | | 7.1 | 17.2 | 180 | 046 | | 86.5 | | | | | | | | | | span |
| | | | | | | | | | | | | | | | | | | | span gas |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | Water accumulating |
| | | | | | | | | | | | | | | | | | | | in lines; left running |
| | | | | | | | | | | | | | | | | | | | on ambient air overnight |
| | | | | | | | | | | | | | | | | | | | to dry lines. |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

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# FIELD DATA SHEET

ACUREX Aerotherm

Plant Chevron EER

Location SVS-69

Operator Best

Date 2-3-84

Load Range

Ambient Temperature 63°F

Barometric Pressure (1200) 29.32

Static Pressure Duct

Fuel Lease crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0840 | calibrate | | | | | | | | | | | | | | | | | | 1320 Dwyer [illegible] |
| | internal & external | | | | | | | | | | | | | | | | | | gauge reading < [illegible] |
| | | | | | | | | | | | | | | | | | | | |
| 0900 | Start | | | | | | | | | | | | | | | | | | 0 psi with probe blocked |
| 0910 | | | | 2.8 | 13.7 | 19 | — | | 82 | | | | | | | | | 503 | |
| 0925 | | | | 2.8 | 13.8 | 17 | 673 | | 75 | | | | | | | | | | |
| 0940 | | | | 2.7 | 13.7 | 18 | 674 | | 74 | | | | | | | | | 496 | |
| 0955 | | | | 2.6 | 13.5 | 18 | 663 | | 75 | | | | | | | | | | |
| 1010 | | | | 2.7 | 13.3 | 17 | 660 | | 72 | | | | | | | | | 489 | |
| 1025 | | | | 2.6 | 13.3 | 17 | 669 | | 72 | | | | | | | | | | |
| 1040 | | | | 2.6 | 13.2 | 15 | 665 | | 71 | | | | | | | | | 486 | |
| 1055 | | | | 2.6 | 13.4 | 18 | 670 | | 72 | | | | | | | | | | |
| 1110 | | | | 2.5 | 13.0 | 17 | 671 | | 74 | | | | | | | | | 489 | |
| 1125 | | | | 2.7 | 12.9 | 13 | 668 | | 72 | | | | | | | | | | |
| 1190 | | | | 2.6 | 13.1 | 22 | 666 | | 71 | | | | | | | | | 489 | |
| 1155 | | | | 2.6 | 13.0 | 23 | 661 | | 69 | | | | | | | | | | |
| 1210 | | | | 2.8 | 12.8 | 22 | 657 | | 71 | | | | | | | | | 502 | |
| 1225 | | | | 2.7 | 12.6 | 24 | 656 | | 72 | | | | | | | | | | |
| 1240 | | | | 2.8 | 12.5 | 21 | 652 | | 70 | | | | | | | | | 502 | |
| 1255 | | | | 2.7 | 13.0 | 23 | 632 | | 69 | | | | | | | | | | |
| 1310 | | | | 3.0 | 12.7 | 24 | 624 | | 68 | | | | | | | | | 502 | |
| 1325 | | | | 2.8 | 12.7 | 20 | 638 | | 68 | | | | | | | | | | |
| 1340 | | | | 2.9 | 12.6 | 23 | 638 | | 69 | | | | | | | | | | |
| 1355 | | | | 2.7 | 12.6 | 25 | 643 | | 70 | | | | | | | | | | |
| 1410 | | | | 2.6 | 12.6 | 25 | 644 | | 69 | | | | | | | | | | |
| 1425 | | | | 2.7 | 12.6 | 24 | 640 | | 69 | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-3-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1440 | internal cal | | | 0.0 | 0.0 | +5 | +14 | | [illegible] | | | | | | | | | | zero |
| | | | | 7.15 | 17.1 | 170 | 590 | | 91.5 | | | | | | | | | | span |
| | | | | | | | | | | | | | | | | | | | span gas |
| 1655 | recalibrate | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| 1710 | Start | | | | | | | | | | | | | | | | | | Stack T.C. out |
| 1721 | | | | 2.7 | 13.9 | 22 | 637 | | 74 | | | | | | | | | | |
| 1736 | | | | 2.8 | 13.9 | 20 | 614 | | 74 | | | | | | | | | | → fixed $SO_2$ autodata |
| 1751 | | | | 2.8 | 13.8 | 23 | 601 | | 73 | | | | | | | | | | |
| 1806 | | | | 2.7 | 13.7 | 23 | 597 | | 74 | | | | | | | | | | |
| 1821 | | | | 2.7 | 13.5 | 23 | 594 | | 74 | | | | | | | | | | |
| 1836 | | | | 2.8 | 13.4 | 22 | 589 | | 73 | | | | | | | | | | |
| 1851 | | | | 2.8 | 13.4 | 22 | 587 | | 70 | | | | | | | | | | |
| 1906 | | | | 2.8 | 13.5 | 20 | 587 | | 69 | | | | | | | | | | |
| 1921 | | | | 2.8 | 13.5 | 20 | 587 | | 69 | | | | | | | | | | |
| 1936 | | | | 2.7 | 13.6 | 19 | 574 | | 68 | | | | | | | | | | |
| 1751 | | | | 2.7 | 13.6 | 23 | 668 | | 69 | | | | | | | | | | |
| 2006 | | | | 2.7 | 13.6 | 26 | 545 | | 71 | | | | | | | | | | |
| 2021 | | | | 2.7 | 13.6 | 26 | 545 | | 71 | | | | | | | | | | |
| 2036 | | | | 2.7 | 13.6 | 32 | 544 | | 71 | | | | | | | | | | |
| 2051 | | | | 2.8 | 13.6 | 30 | 545 | | 70 | | | | | | | | | | |
| 2106 | | | | 2.8 | 13.6 | 29 | 543 | | 71 | | | | | | | | | | |
| 2121 | | | | 2.7 | 13.7 | 34 | 543 | | 68 | | | | | | | | | | |
| 2136 | | | | 2.8 | 13.7 | 35 | 543 | | 68 | | | | | | | | | | |
| 2151 | | | | 2.8 | 13.6 | 32 | 541 | | 66 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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**ACUREX Aerotherm**

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-3-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 2206 | | | | 2.9 | 13.6 | 32 | 541 | | 67 | | | | | | | | | | |
| 2221 | | | | 2.6 | 13.8 | 38 | 542 | | 67 | | | | | | | | | | |
| 2236 | | | | 2.7 | 13.7 | 35 | 540 | | 66 | | | | | | | | | | |
| 2251 | | | | 2.8 | 13.7 | 36 | 542 | | 69 | | | | | | | | | | |
| 2306 | | | | 2.7 | 13.7 | 35 | 536 | | 70 | | | | | | | | | | |
| 2321 | | | | 2.8 | 13.6 | 36 | 537 | | 71 | | | | | | | | | | |
| 2336 | | | | 2.8 | 13.7 | 37 | 535 | | 70 | | | | | | | | | | |
| 2351 | | | | 2.9 | 13.7 | 33 | 538 | | 68 | | | | | | | | | | |
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ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)
Location SVS-69
Operator Best
Date 2-4-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0006 | | | | 2.6 | 13.8 | 38 | 533 | | 70 | | | | | | | | | | |
| 0021 | | | | 2.7 | 14.5 | 39 | 529 | | 74 | | | | | | | | | | |
| 0051 | | | | 2.7 | 14.2 | 37 | 529 | | 73 | | | | | | | | | | |
| 0106 | | | | 2.7 | 14.3 | 25 | 582 | | 75 | | | | | | | | | | |
| 0121 | | | | 2.8 | 14.2 | 24 | 617 | | 75 | | | | | | | | | | |
| 0136 | | | | 2.8 | 14.1 | 20 | 628 | | 71 | | | | | | | | | | |
| 0151 | | | | 2.9 | 14.0 | 19 | 622 | | 72 | | | | | | | | | | |
| 0206 | | | | 2.9 | 13.9 | 20 | 629 | | 71 | | | | | | | | | | |
| 0221 | | | | 2.9 | 13.9 | 22 | 627 | | 75 | | | | | | | | | | |
| 0236 | | | | 2.8 | 13.9 | 21 | 626 | | 75 | | | | | | | | | | |
| 0251 | | | | 2.8 | 13.8 | 20 | 640 | | 74 | | | | | | | | | | |
| 0306 | | | | 2.8 | 13.7 | 20 | 647 | | 71 | | | | | | | | | | |
| 0321 | | | | 2.8 | 13.6 | 21 | 646 | | 71 | | | | | | | | | | |
| 0336 | | | | 2.8 | 13.7 | 21 | 651 | | 80 | | | | | | | | | | |
| 0351 | | | | 2.6 | 13.7 | 21 | 658 | | 82 | | | | | | | | | | |
| 0406 | | | | 2.6 | 13.7 | 20 | 660 | | 82 | | | | | | | | | | |
| 0421 | | | | 2.7 | 13.4 | 19 | 656 | | 78 | | | | | | | | | | |
| 0436 | | | | 2.9 | 13.4 | 18 | 658 | | 77 | | | | | | | | | | |
| 0451 | | | | 2.9 | 13.3 | 20 | 660 | | 77 | | | | | | | | | | |
| 0506 | | | | 2.6 | 13.5 | 19 | 678 | | 77 | | | | | | | | | | |
| 0521 | | | | 2.6 | 13.3 | 19 | 672 | | 78 | | | | | | | | | | |
| 0536 | | | | 2.8 | 13.2 | 17 | 661 | | 78 | | | | | | | | | | |
| 0551 | | | | 2.4 | 13.4 | 20 | 680 | | 81 | | | | | | | | | | |
| 0606 | | | | 2.6 | 13.3 | 19 | 678 | | 88 | | | | | | | | | | |
| 062 | | | | 2.5 | 13.3 | 21 | 671 | | 88 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

# FIELD DATA SHEET

ACUREX Aerotherm

Plant

Location

Operator

Date 2-4-84

Load Range

Ambient Temperature

Barometric Pressure

Static Pressure Duct

Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0636 | | | | 2.5 | 13.3 | 20 | 691 | | 88 | | | | | | | | | | |
| 0651 | | | | 2.5 | 13.3 | 21 | 680 | | 95 | | | | | | | | | | |
| 0706 | | | | 2.6 | 13.1 | 20 | 676 | | 93 | | | | | | | | | | |
| 0721 | | | | 2.6 | 13.1 | 23 | 678 | | 93 | | | | | | | | | | |
| 0736 | | | | 2.8 | 13.1 | 20 | 667 | | 95 | | | | | | | | | | |
| 0751 | | | | 2.6 | 13.1 | 21 | 680 | | 88 | | | | | | | | | | |
| 0806 | | | | 2.6 | 13.1 | 21 | 633 | | 86 | | | | | | | | | | |
| 0821 | | | | 2.5 | 13.9 | 22 | 653 | | 83 | | | | | | | | | | |
| 0836 | | | | 2.7 | 12.7 | 19 | 568 | | 82 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| 0840 | internal cal | | | 0.0 | -0.1 | +7.5 | +9 | | 0 | | | | | | | | | | zero |
| | | | | | 17.5 | | 512 | | | | | | | | | | | | span |
| | | | | | | | | | | | | | | | | | | | [illegible] |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | Water in lines. |
| | | | | | | | | | | | | | | | | | | | Left internal lines |
| | | | | | | | | | | | | | | | | | | | on nitrogen; purge |
| | | | | | | | | | | | | | | | | | | | overnight with |
| | | | | | | | | | | | | | | | | | | | ambient air. |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

032 1/82

ACUREX Aerotherm

# FIELD DATA SHEET

Plant chevron (CEER)
Location SVS-69
Operator Best/Milburn
Date 2-5-84
Load Range

Ambient Temperature 69°F 58°F
Barometric Pressure 29.34 (1435) 29.42 (2030)
Static Pressure Duct
Fuel lease crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1410 | Internal & External cal | | | | | | | | | | | | | | | | | | Water still in line |
| 1430 | Start | | | | | | | | | | | | | | | | | | at 0900 |
| 1432 | | | | 2.7 | 13.9 | 27 | 640 | | 68 | | | | | | | | | 522 | Leak check okay |
| 1447 | | | | 2.9 | 13.7 | 22 | 625 | | 69 | | | | | | | | | | |
| 1502 | | | | 2.7 | 13.6 | 20 | 624 | | 70 | | | | | | | | | 526 | |
| 1517 | | | | 2.6 | 13.7 | 18 | 640 | | 70 | | | | | | | | | | |
| 1532 | | | | 2.7 | 13.6 | 17 | 632 | | 69 | | | | | | | | | 526 | |
| 1602 | | | | 2.8 | 13.4 | 16 | 631 | | 67 | | | | | | | | | 527 | |
| 1547 | | | | 2.7 | 13.[illegible] | 18 | 636 | | 67 | | | | | | | | | | |
| 1617 | | | | 2.8 | 13.4 | 19 | 639 | | 69 | | | | | | | | | | |
| 1632 | | | | 2.7 | 13.4 | 17 | 643 | | 68 | | | | | | | | | 528 | |
| 1647 | | | | 2.8 | 13.5 | 15 | 652 | | 72 | | | | | | | | | | |
| 1702 | | | | 2.8 | 13.4 | 15 | 649 | | 72 | | | | | | | | | 537 | |
| 1717 | | | | 2.7 | 13.4 | 15 | 656 | | 73 | | | | | | | | | | |
| 1732 | | | | 2.9 | 13.4 | 15 | 657 | | 71 | | | | | | | | | 540 | |
| 1747 | | | | 2.8 | 13.4 | 13 | 664 | | 71 | | | | | | | | | | |
| 1802 | | | | 2.9 | 13.4 | 15 | 675 | | 70 | | | | | | | | | 537 | |
| 1817 | | | | 2.9 | 13.4 | 9 | 675 | | 67 | | | | | | | | | | |
| 1832 | | | | 2.9 | 13.4 | 13 | 691 | | 70 | | | | | | | | | 533 | |
| 1847 | | | | 2.8 | 13.6 | 12 | 692 | | 72 | | | | | | | | | | |
| 1902 | | | | 2.6 | 13.6 | 13 | 697 | | 70 | | | | | | | | | 531 | |
| 1917 | | | | 2.8 | 13.5 | 13 | 697 | | 70 | | | | | | | | | | |
| 1932 | | | | 2.7 | 13.6 | 12 | 713 | | 69 | | | | | | | | | 528 | |
| 1947 | | | | 2.6 | 13.7 | 12 | 715 | | 70 | | | | | | | | | | |
| 2002 | | | | 2.8 | 13.6 | 12 | 705 | | 68 | | | | | | | | | 534 | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-5-84 (cont.)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 2017 | | | | 2.8 | 13.5 | 11 | 702 | | 68 | | | | | | | | | 527 | |
| 2032 | | | | 2.8 | 14.1 | 8 | 704 | | 67 | | | | | | | | | | |
| 2047 | | | | 2.6 | 14.3 | 10 | 703 | | 73 | | | | | | | | | 531 | |
| 2102 | | | | 2.9 | 14.1 | 9 | 705 | | 74 | | | | | | | | | | |
| 2117 | | | | 2.8 | 14.1 | 10 | 716 | | 71 | | | | | | | | | 532 | |
| 2132 | | | | 2.8 | 14.1 | 9 | 696 | | 68 | | | | | | | | | | |
| 2147 | | | | 2.6 | 14.3 | 10 | 703 | | 72 | | | | | | | | | 531 | |
| 2202 | | | | 2.9 | 14.1 | 9 | 705 | | 74 | | | | | | | | | | |
| 2217 | | | | 2.8 | 14.2 | 9 | 708 | | 74 | | | | | | | | | 523 | |
| 2232 | | | | 2.8 | 14.1 | 12 | 707 | | 73 | | | | | | | | | | |
| 2247 | | | | 2.8 | 14.1 | 11 | 712 | | 68 | | | | | | | | | 520 | |
| 2302 | | | | 2.7 | 14.3 | 11 | 712 | | 71 | | | | | | | | | | Pump failed after 2302. |
| 2317 | pump stopped | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

# FIELD DATA SHEET

ACUREX Aerotherm

Plant Chevron EER
Location SUS-69
Operator Milburn / Best
Date 2-6-84
Load Range

Ambient Temperature 67°F
Barometric Pressure 2952 (1115)
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED $O_2$ % | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0840 | span | | | +0.1 | -0.2 | 0 | +6 | | 0 | zero | | | | | | | | | O2 1% |
| | | | | 7.35 | 16.1 | 165 | 512 | | 87 | Span | | | | | | | | | CO 540 ppm |
| 0900 | internal/external | | | 7.25 | | 185 | 553 | | 90.1 | span gas | | | | | | | | | SO2 800ppm |
| | cal | | | | | | | | | | | | | | | | | | leak check okay |
| | | | | | | | | | | | | | | | | | | | ~~Black [illegible]~~ |
| 0935 | Start | | | | | | | | | | | | | | | | | | BLACK plume |
| 0947 | | | | 3.4 | 13.3 | 25 | 656 | | 62 | | | | | | | | | | when CO high and |
| 1002 | | | | 2.8 | 13.9 | 14 | 657 | | 60 | | | | | | | | | 435 | erratic when |
| 1017 | | | | 2.8 | 13.3 | 14 | 590 | | 67 | | | | | | | | | | adjusted [illegible] |
| 1032 | | | | 2.5 | 14.5 | 26 | 660 | | 61 | | | | | | | | | 424 | |
| 1047 | | | | 1.0 | 15.6 | 49 | 734 | | 58 | | | | | | | | | | Unit operating at |
| 1102 | | | | 1.1 | 15.6 | 50 | 700 | | 57 | | | | | | | | | 375 | lower fuel rate |
| 1117 | | | | 1.0 | 15.5 | 28 | 698 | | 57 | | | | | | | | | | |
| 1132 | | | | 0.9 | 15.7 | 55 | 714 | | 58 | | | | | | | | | 374 | |
| 1147 | | | | 0.8 | 15.6 | 80 | 701 | | 55 | | | | | | | | | | |
| 1202 | | | | 0.7 | 15.8 | 315 | 768 | | 55 | | | | | | | | | | |
| 1217 | | | | 2.6 | 14.6 | 28 | 636 | | 54 | | | | | | | | | | |
| 1232 | | | | 2.8 | 14.4 | 23 | 628 | | 55 | | | | | | | | | 392 | |
| 1247 | | | | 2.8 | 14.4 | 25 | 627 | | 56 | | | | | | | | | | |
| 1302 | | | | 2.8 | 14.2 | 18 | 627 | | 54 | | | | | | | | | 417 | |
| 1317 | | | | 2.9 | 14.2 | 27 | 624 | | 55 | | | | | | | | | | |
| 1332 | | | | 2.7 | 14.2 | 30 | 626 | | 55 | | | | | | | | | 427 | |
| 1347 | | | | 2.6 | 14.7 | 23 | 627 | | 54 | | | | | | | | | | |
| 1402 | | | | 2.8 | 14.5 | 25 | 618 | | 55 | | | | | | | | | 426 | |
| 1417 | | | | 2.9 | 14.4 | 24 | 617 | | 55 | | | | | | | | | | |
| 1432 | | | | 3.0 | 14.2 | 22 | 658 | | 54 | | | | | | | | | 426 | AVERAGE |
| 1447 | | | | 2.8 | 14.6 | 4 | 645 | | 55 | | | | | | | | | | |
| 1502 | | | | 2.4 | 14.2 | 11 | 712 | | 55 | | | | | | | | | 413 | |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-6-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1500 | span | | | +0.2 | 0.0 | -10 | +3 | | 0 | | | | | | | | | | zero |
| | | | | 6.8 | 18.8 | 180 | 500 | | 90 | | | | | | | | | | span |
| | | | | | | | | | | | | | | | | | | | span gas |
| | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | |

032 1/82

# FIELD DATA SHEET

**ACUREX Aerotherm**

Plant Chevron EER
Location SVS-69
Operator Best/Milburn
Date 2-7-84
Load Range

Ambient Temperature 56°F 70°F
Barometric Pressure 29.43 (0900) 29.32 (1500)
Static Pressure Duct
Fuel Lease crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0800 | internal & external | | | | | | | | | | | | | | | | | | 1020 smoke point |
| | calibration | | | | | | | | | | | | | | | | | | < no. 1 |
| | | | | | | | | | | | | | | | | | | | leak check okay |
| 0830 | Start | | | | | | | | | | | | | | | | | | |
| 0831 | | | | 2.8 | 14.4 | 12 | 706 | | 61 | | | | | | | | | 453 | |
| 0846 | | | | 2.7 | 14.6 | 11 | 762 | | 61 | | | | | | | | | | |
| 0901 | | | | 2.7 | 14.3 | 13 | 741 | | 65 | | | | | | | | | 456 | |
| 0916 | | | | 2.6 | 14.5 | 12 | 745 | | 66 | | | | | | | | | | |
| 0931 | | | | 2.8 | 14.4 | 10 | 743 | | 64 | | | | | | | | | 461 | |
| 0946 | | | | 2.8 | 14.3 | 12 | 691 | | 66 | | | | | | | | | | |
| 1001 | | | | 2.7 | 14.3 | 5 | 727 | | 67 | | | | | | | | | 462 | |
| 1016 | | | | 2.5 | 14.3 | 9 | 721 | | 66 | | | | | | | | | | |
| 1031 | | | | 2.7 | 13.8 | 13 | 624 | | 65 | | | | | | | | | 467 | |
| 1046 | | | | 2.5 | 14.3 | 10 | 726 | | 65 | | | | | | | | | | |
| 1101 | | | | 2.6 | 14.2 | 10 | 572 | | 64 | | | | | | | | | 469 | |
| 1116 | | | | 2.6 | 13.7 | 10 | 659 | | 65 | | | | | | | | | | |
| 1131 | | | | 3.1 | 13.7 | 15 | 618 | | 63 | | | | | | | | | 471 | |
| 1146 | | | | 2.7 | 14.0 | 16 | 614 | | 70 | | | | | | | | | | |
| 1201 | | | | 2.8 | 13.8 | 15 | 664 | | 68 | | | | | | | | | 472 | |
| 1216 | | | | 2.6 | 13.8 | 15 | 664 | | 66 | | | | | | | | | | |
| 1231 | | | | 2.5 | 14.1 | 16 | 665 | | 66 | | | | | | | | | 469 | |
| 1246 | | | | 2.5 | 13.9 | 21 | 655 | | 62 | | | | | | | | | | |
| 1315 | | | | 2.4 | 13.6 | 17 | 673 | | 61 | | | | | | | | | 464 | |
| 1330 | | | | 2.5 | 13.5 | 18 | 671 | | 61 | | | | | | | | | | |
| 1345 | | | | 2.8 | 13.7 | 15 | 673 | | 64 | | | | | | | | | 489 | |
| 1400 | | | | 2.7 | 13.8 | 14 | 674 | | 65 | | | | | | | | | | AVERAGE |
| 1415 | | | | 2.7 | 13.8 | [illegible] | 672 | | 64 | | | | | | | | | 507 | |
| 1430 | | | | 2.7 | 14.0 | 4 | 665 | | 65 | | | | | | | | | | |

032 1/82

ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-7-84 (cont.)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1445 | | | | 2.6 | 14.0 | 5 | 665 | | 64 | | | | | | | | | 504 | |
| 1500 | | | | 2.8 | 14.0 | 6 | 651 | | 65 | | | | | | | | | | |
| 1508 | zero and span | | | | | | | | | | | | | | | | | | |
| | and recal | | | 0.0 | 0.0 | -20 | 0 | | +1 | | | | | | | | | | zero |
| | | | | 7.1 | 17.3 | 165 | 620 | | 88 | | | | | | | | | | Span |
| | | | | 7.25 | 18.15 | | | | 90 | | | | | | | | | | span gas value |
| | | | | | | | | | | | | | | | | | | | |
| 1535 | Start | | | | | | | | | | | | | | | | | | |
| 1545 | | | | 2.9 | 14.7 | 28 | 583 | | 73 | | | | | | | | | 498 | |
| 1600 | | | | 2.8 | 14.4 | 28 | 589 | | 74 | | | | | | | | | | |
| 1615 | | | | 2.8 | 14.5 | 31 | 591 | | 75 | | | | | | | | | 497 | |
| 1630 | | | | 2.8 | 14.7 | 28 | 601 | | 79 | | | | | | | | | | |
| 1645 | | | | 2.7 | 14.7 | 31 | 598 | | 68 | | | | | | | | | 500 | |
| 1700 | | | | 2.8 | 14.7 | 30 | 597 | | 69 | | | | | | | | | | |
| 1715 | | | | 3.1 | 13.6 | 31 | 522 | | 73 | | | | | | | | | 515 | |
| 1730 | | | | 2.8 | 13.7 | 39 | 521 | | 74 | | | | | | | | | | |
| 1745 | | | | 2.8 | 14.0 | 40 | 519 | | 82 | | | | | | | | | 521 | |
| 1800 | | | | 2.9 | 14.0 | 41 | 521 | | 79 | | | | | | | | | | |
| 1815 | | | | 2.9 | 14.1 | 39 | 523 | | 83 | | | | | | | | | 518 | |
| 1830 | | | | 3.0 | 14.1 | 40 | 520 | | 86 | | | | | | | | | | |
| 1845 | | | | 3.0 | 14.2 | 38 | 523 | | 87 | | | | | | | | | 513 | |
| 1900 | | | | 3.0 | 14.3 | 39 | 524 | | 86 | | | | | | | | | | |
| 1915 | | | | 3.0 | 14.3 | 34 | 522 | | 87 | | | | | | | | | 516 | |
| 1930 | | | | 2.8 | 14.4 | 38 | 521 | | 82 | | | | | | | | | | |
| 1945 | | | | 3.0 | 14.4 | 34 | 520 | | 82 | | | | | | | | | 523 | |
| 2000 | | | | 3.0 | 14.4 | 33 | 516 | | 80 | | | | | | | | | | AVERAGE |
| 2015 | | | | 2.9 | 14.5 | 34 | 520 | | 78 | | | | | | | | | 523 | |
| 2030 | | | | 3.0 | 14.5 | 33 | 518 | | 77 | | | | | | | | | | |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-7-84 (cont.)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 2045 | | | | 3.0 | 14.4 | 31 | 517 | | 70 | | | | | | | | | 522 | |
| 2100 | | | | 2.9 | 14.6 | 33 | 514 | | 70 | | | | | | | | | | |
| 2115 | | | | 3.0 | 14.5 | 35 | 514 | | 69 | | | | | | | | | 519 | |
| 2130 | | | | 3.0 | 14.5 | 32 | 516 | | 70 | | | | | | | | | | |
| 2145 | | | * | 2.9 | 14.7 | 30 | 512 | | 70 | | | | | | | | | 519 | *Autodata O2 output |
| 2200 | | | | 3.0 | 14.6 | 36 | 509 | | 70 | | | | | | | | | | suddenly negative |
| 2215 | | | | 3.0 | 14.6 | 36 | 506 | | 66 | | | | | | | | | 515 | O2 values from chart |
| 2230 | | | | 2.9 | 15.8 | 33 | — | | 74 | | | | | | | | | | 2225 adjust flow |
| 2245 | | | | 2.9 | 15.2 | 31 | 468 | | 70 | | | | | | | | | 517 | |
| 2300 | | | | 3.0 | 14.6 | 36 | 484 | | 68 | | | | | | | | | | |
| 2315 | | | | 3.0 | 14.3 | 37 | 457 | | 68 | | | | | | | | | 517 | |
| 2330 | | | | 3.0 | 14.2 | 33 | 456 | | 67 | | | | | | | | | | |
| 2345 | | | | 3.0 | 14.1 | 35 | 461 | | 70 | | | | | | | | | 519 | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)
Location SUS 69
Operator Milburn / Best
Date 2-8-84
Load Range

Ambient Temperature 66°F
Barometric Pressure 29.33 (1430)
Static Pressure Duct
Fuel lease Crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0000 | | | | 3.1 | 13.9 | 34 | 466 | | 67 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | flow loss |
| 0745 | span internal | | | | | | | | | | | | | | | | | | |
| | | | | +0.1 | +0.3 | +20 | +15 | | +0.7 | | | | | | | | | | zero |
| | | | | 7.4 | 18.6 | 195 | 498 | | 90.1 | | | | | | | | | | span |
| | | | | 7.25 | 18.2 | 185 | 553 | | 90.1 | | | | | | | | | | span gas |
| calibrate internal | | | | | | | | | | | | | | | | | | | leak check okay |
| & external | | | | | | | | | | | | | | | | | | | |
| 0955 | Start | | | | | | | | | | | | | | | | | | |
| 1000 | | | | 2.8 | 14.5 | 21 | 688 | | 67 | | | | | | | | | 503 | |
| 1015 | | | | 2.8 | 14.7 | 25 | 673 | | 67 | | | | | | | | | | |
| 1030 | | | | 2.7 | 13.8 | 22 | 676 | | 67 | | | | | | | | | 512 | |
| 1045 | | | | 2.8 | 14.7 | 22 | 684 | | 66 | | | | | | | | | | |
| 1100 | | | | 2.8 | 14.7 | 22 | 685 | | 65 | | | | | | | | | 517 | |
| 1115 | | | | 2.8 | 14.8 | 24 | 681 | | 77 | | | | | | | | | | |
| 1130 | | | | 2.8 | 14.7 | 27 | 682 | | 70 | | | | | | | | | 525 | |
| 1145 | | | | 2.7 | 14.7 | 24 | 678 | | 71 | | | | | | | | | | |
| 1200 | | | | 2.7 | 14.3 | 19 | 684 | | 69 | | | | | | | | | 524 | |
| 1215 | | | | 2.6 | 14.5 | 17 | 688 | | 72 | | | | | | | | | | |
| 1230 | | | | 2.9 | 14.5 | 17 | 679 | | 74 | | | | | | | | | 528 | |
| 1245 | | | | 2.8 | 14.4 | 16 | 693 | | 71 | | | | | | | | | | |
| 1300 | | | | 2.9 | 14.2 | 11 | 703 | | 70 | | | | | | | | | 529 | |
| 1315 | | | | 2.8 | 14.2 | 14 | 706 | | 70 | | | | | | | | | | |
| 1330 | | | | 2.8 | 14.2 | 13 | 717 | | 71 | | | | | | | | | 526 | AVERAGE |
| 1345 | | | | 2.9 | 14.2 | 17 | 706 | | 73 | | | | | | | | | | |
| 1400 | | | | 3.0 | 13.9 | 12 | 700 | | 76 | | | | | | | | | 529 | |
| 1415 | | | | 3.0 | 13.8 | 14 | 698 | | 76 | | | | | | | | | | |

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ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-8-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1430 | | | | 2.4 | 14.3 | 9 | 722 | | 73 | | | | | | | | | 532 | |
| 1445 | | | | 2.8 | 14.3 | 11 | 699 | | 73 | | | | | | | | | | |
| 1500 | | | | 2.7 | 14.1 | 12 | 700 | | 70 | | | | | | | | | 526 | |
| 1515 | | | | 2.8 | 14.0 | 14 | 673 | | 66 | | | | | | | | | | |
| 1530 | | | | 3.2 | 13.8 | 18 | 637 | | 63 | | | | | | | | | 519 | * change in fuel rate |
| 1545 | | | | 3.0 | 13.8 | 18 | 635 | | 62 | | | | | | | | | | |
| 1600 | | | | 3.1 | 13.7 | 15 | 631 | | 63 | | | | | | | | | 518 | |
| 1615 | | | | 3.2 | 13.5 | 16 | 622 | | 61 | | | | | | | | | | |
| 1630 | | | | 3.2 | 13.6 | 18 | 630 | | 61 | | | | | | | | | 519 | |
| 1645 | | | | 3.1 | 14.4 | 23 | 627 | | 61 | | | | | | | | | | |
| 1700 | | | | 3.2 | 13.9 | 21 | 633 | | 63 | | | | | | | | | 524 | |
| 1715 | | | | 3.2 | 13.4 | 20 | 635 | | 66 | | | | | | | | | | |
| 1750 | | | | 3.2 | 13.7 | 23 | 642 | | 67 | | | | | | | | | 534 | |
| 1745 | | | | 3.2 | 13.5 | 22 | 642 | | 77 | | | | | | | | | | |
| 1800 | | | | 3.4 | 13.5 | 18 | 629 | | 77 | | | | | | | | | 537 | |
| 1815 | | | | 3.2 | 13.6 | 19 | 643 | | 75 | | | | | | | | | | |
| 1830 | | | | 3.3 | 14.0 | 20 | 630 | | 80 | | | | | | | | | 533 | |
| 1845 | | | | 3.2 | 13.7 | 21 | 629 | | 80 | | | | | | | | | | |
| 1900 | | | | 2.9 | 13.3 | 18 | 639 | | 70 | | | | | | | | | 535 | |
| 1915 | | | | 3.1 | 13.8 | 18 | 638 | | 65 | | | | | | | | | | |
| 1930 | | | | 3.2 | 13.8 | 21 | 629 | | 73 | | | | | | | | | 533 | |
| 1945 | | | | 3.2 | 13.9 | 21 | 633 | | 65 | | | | | | | | | | |
| 2000 | | | | 3.2 | 13.9 | 22 | 625 | | 63 | | | | | | | | | 523 | |
| 2015 | | | | 3.2 | 13.9 | 24 | 631 | | 62 | | | | | | | | | | |
| 2030 | | | | 3.2 | 13.9 | 21 | 633 | | 64 | | | | | | | | | | |
| 2045 | Internal span | | | 0.0 | -0.2 | ±0 | ±5 | | ±0.5 | | | | | | | | | | zero AVERAGE |
| | | | | 6.85 | 17.5 | 161 | 528 | | 85 | | | | | | | | | | Span |
| | | | | | | | | | | | | | | | | | | | span gas |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron EER
Location SUS 69
Operator MILBURN
Date 2-9-84
Load Range

Ambient Temperature 65°F
Barometric Pressure 29.27 (1500)
Static Pressure Duct
Fuel lease Crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0840 | internal and external<br>calibration | | | | | | | | | | | | | | | | | | leak check okay |
| 1000 | Start | | | | | | | | | | | | | | | | | | |
| 1006 | | | | 3.2 | 13.9 | 17 | 529 | | 73 | | | | | | | | | 537 | |
| 1021 | | | | 3.1 | 13.8 | 17 | 539 | | 70 | | | | | | | | | | |
| 1036 | | | | 3.1 | 13.8 | 17 | 549 | | 69 | | | | | | | | | 538 | |
| 1051 | | | | 2.9 | 13.7 | 14 | 554 | | 66 | | | | | | | | | | |
| 1106 | | | | 3.1 | 13.8 | 23 | 554 | | 64 | | | | | | | | | 533 | |
| 1121 | | | | 3.0 | 13.6 | 17 | 539 | | 64 | | | | | | | | | | |
| 1136 | | | | 2.9 | 13.8 | 17 | 549 | | 67 | | | | | | | | | 521 | |
| 1151 | | | | 2.8 | 14.1 | 16 | 544 | | 68 | | | | | | | | | | |
| 1206 | | | | 2.9 | 14.0 | 16 | 529 | | 68 | | | | | | | | | 520 | |
| 1221 | | | | 3.1 | 13.9 | 15 | 544 | | 68 | | | | | | | | | | |
| 1236 | | | | 2.9 | 14.1 | 15 | 549 | | 68 | | | | | | | | | 523 | |
| 1251 | | | | 2.9 | 14.0 | 15 | 544 | | 69 | | | | | | | | | | |
| 1306 | | | | 3.0 | 13.7 | 19 | 559 | | 64 | | | | | | | | | 524 | |
| 1321 | | | | | | | | | | | | | | | | | | | check CO zero |
| 1336 | | | | 2.8 | 13.7 | 21 | 579 | | 71 | | | | | | | | | 523 | |
| 1351 | | | | 2.7 | 13.6 | 22 | 579 | | 69 | | | | | | | | | | |
| 1406 | | | | 2.8 | 13.7 | 21 | 589 | | 65 | | | | | | | | | 531 | |
| 1421 | | | | 2.8 | 13.5 | 20 | 584 | | 66 | | | | | | | | | | |
| 1436 | | | | 3.0 | 13.4 | 16 | 569 | | 65 | | | | | | | | | 536 | |
| 1451 | | | | 2.9 | 13.5 | 16 | 605 | | 74 | | | | | | | | | | |
| 1506 | | | | 3.1 | 13.4 | 14 | 619 | | 75 | | | | | | | | | 538 | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-9-84 (cont)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED |  |  |  |  |  |  | CORRECTED TO 3% O2 DRY |  |  | HYDROCARBONS (HC) |  |  | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC |  |  |  |
| 1521 |  |  |  | 2.9 | 13.6 | 15 | 627 |  | 76 |  |  |  |  |  |  |  |  |  |  |
| 1536 |  |  |  | 2.9 | 13.6 | 12 | 632 |  | 76 |  |  |  |  |  |  |  |  |  | 536 |  |
| 1551 |  |  |  | 2.9 | 13.6 | 13 | 635 |  | 75 |  |  |  |  |  |  |  |  |  |  |
| 1606 |  |  |  | 3.0 | 13.4 | 14 | 633 |  | 76 |  |  |  |  |  |  |  |  | 537 |  |
| 1621 |  |  |  | 2.9 | 13.3 | 8 | 640 |  | 72 |  |  |  |  |  |  |  |  |  |  |
| 1636 |  |  |  | 3.2 | 13.2 | 11 | 629 |  | 70 |  |  |  |  |  |  |  |  | 536 |  |
| 1640 | span & calibrate internal |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | 0.0 | 0.0 | -5 | -10 |  | 0 |  |  |  |  |  |  |  |  |  | zero |
|  |  |  |  | 6.8 | 16.2 | 165 | 560 |  | 89 |  |  |  |  |  |  |  |  |  | span |
|  |  |  |  | 7.2 | 18.4 | 183 | 545 |  | 90 |  |  |  |  |  |  |  |  |  | span gas |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1721 |  |  |  | 2.7 | 14.6 | 27 | 601 |  | 77 |  |  |  |  |  |  |  |  |  |  |
| 1736 |  |  |  | 2.8 | 14.3 | 21 | 596 |  | 82 |  |  |  |  |  |  |  |  | 538 |  |
| 1751 |  |  |  | 3.0 | 14.1 | 28 | 588 |  | 80 |  |  |  |  |  |  |  |  |  |  |
| 1806 |  |  |  | 2.9 | 14.2 | 28 | 577 |  | 70 |  |  |  |  |  |  |  |  | 512 |  |
| 1821 |  |  |  | 2.8 | 14.4 | 26 | 592 |  | 67 |  |  |  |  |  |  |  |  |  |  |
| 1836 |  |  |  | 2.9 | 14.4 | 22 | 594 |  | 67 |  |  |  |  |  |  |  |  | 494 |  |
| 1851 |  |  |  | 2.8 | 14.4 | 26 | 592 |  | 67 |  |  |  |  |  |  |  |  |  |  |
| 1906 |  |  |  | 2.8 | 14.5 | 30 | 590 |  | 67 |  |  |  |  |  |  |  |  | 488 |  |
| 1921 |  |  |  | 2.8 | 14.4 | 26 | 585 |  | 65 |  |  |  |  |  |  |  |  |  |  |
| 1936 |  |  |  | 2.8 | 14.5 | 26 | 575 |  | 67 |  |  |  |  |  |  |  |  | 489 |  |
| 1951 |  |  |  | 2.8 | 14.5 | 26 | 594 |  | 67 |  |  |  |  |  |  |  |  |  |  |
| 2006 |  |  |  | 2.7 | 14.6 | 27 | 600 |  | 66 |  |  |  |  |  |  |  |  | 487 |  |
| 2021 |  |  |  | 2.6 | 14.6 | 27 | 607 |  | 63 |  |  |  |  |  |  |  |  |  |  |
| 2036 |  |  |  | 2.8 | 14.7 | 28 | 611 |  | 63 |  |  |  |  |  |  |  |  | 484 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | AVERAGE |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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ACUREX Aerotherm

# FIELD DATA SHEET

Plant ________

Location ________

Operator ________

Date 2-9-84 (cont.)

Load Range ________

Ambient Temperature ________

Barometric Pressure ________

Static Pressure Duct ________

Fuel ________

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 2051 | | | | 2.7 | 14.6 | 27 | 600 | | 68 | | | | | | | | | 493 | |
| 2106 | | | | 2.6 | 14.8 | 31 | 600 | | 65 | | | | | | | | | | |
| 2121 | | | | 2.8 | 14.5 | 27 | 591 | | 66 | | | | | | | | | 495 | |
| 2136 | | | | 2.8 | 14.5 | 27 | 590 | | 67 | | | | | | | | | | |
| 2151 | | | | 2.9 | 14.2 | 25 | 587 | | 66 | | | | | | | | | | drain Venturi bulb |
| 2206 | | | | | | | | | | | | | | | | | | | |
| 2221 | | | | 2.7 | 14.3 | 26 | 602 | | 64 | | | | | | | | | 090 | |
| 2236 | | | | 2.6 | 14.3 | 27 | 605 | | 62 | | | | | | | | | | |
| 2251 | | | | 2.6 | 14.4 | 27 | 606 | | 61 | | | | | | | | | 487 | |
| 2306 | | | | 2.6 | 14.6 | 25 | 612 | | 63 | | | | | | | | | | |
| 2321 | | | | 2.3 | 14.7 | 24 | 615 | | 62 | | | | | | | | | 483 | |
| 2336 | | | | 2.5 | 14.6 | 25 | 609 | | 63 | | | | | | | | | | |
| 2351 | | | | 2.7 | 14.5 | 25 | 597 | | 63 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX
Aerotherm

# FIELD DATA SHEET

Plant Chevron EER
Location SUS 69
Operator MILBURN
Date 2-10-84
Load Range

Ambient Temperature 60°F (1200)
Barometric Pressure 29.43 (1200)
Static Pressure Duct
Fuel lease Crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0006 | | | | 2.6 | 14.5 | 26 | 601 | | 64 | | | | | | | | | 483 | |
| 0021 | | | | 2.7 | 14.5 | 29 | 604 | | 65 | | | | | | | | | | |
| 0036 | | | | 2.5 | 14.7 | 25 | 608 | | 64 | | | | | | | | | 477 | |
| 0051 | | | | 2.2 | 16.0 | 26 | 633 | | 65 | | | | | | | | | | |
| 0106 | | | | 2.4 | 14.8 | 24 | 629 | | 65 | | | | | | | | | 475 | |
| 0121 | | | | 2.8 | 14.5 | 25 | 606 | | 70 | | | | | | | | | | |
| 0136 | | | | 2.6 | 14.6 | 25 | 609 | | 70 | | | | | | | | | 472 | |
| 0151 | | | | 2.6 | 14.5 | 27 | 627 | | 70 | | | | | | | | | | |
| 0206 | | | | 2.7 | 14.6 | 27 | 608 | | 74 | | | | | | | | | 475 | |
| 0221 | | | | 2.7 | 14.6 | 21 | 601 | | 76 | | | | | | | | | | |
| 0236 | | | | 2.6 | 14.6 | 26 | 603 | | 80 | | | | | | | | | 475 | |
| 0251 | | | | 2.7 | 14.5 | 24 | 605 | | 77 | | | | | | | | | | |
| 0306 | | | | 2.8 | 14.5 | 27 | 598 | | 80 | | | | | | | | | 471 | |
| 0321 | | | | 2.7 | 14.5 | 26 | 619 | | 79 | | | | | | | | | | |
| 0336 | | | | 2.8 | 14.3 | 23 | 618 | | 76 | | | | | | | | | 463 | |
| 0351 | | | | 2.7 | 14.5 | 28 | 625 | | 76 | | | | | | | | | | |
| 0406 | | | | 2.6 | 14.6 | 26 | 626 | | 80 | | | | | | | | | 464 | |
| 0421 | | | | 2.7 | 14.4 | 26 | 628 | | 79 | | | | | | | | | | |
| 0436 | | | | 2.2 | 14.8 | 28 | 641 | | 87 | | | | | | | | | 468 | |
| 0451 | | | | 2.4 | 14.5 | 29 | 615 | | 81 | | | | | | | | | | |
| 0506 | | | | 2.7 | 14.4 | 28 | 629 | | 78 | | | | | | | | | 466 | |
| 0521 | | | | 2.3 | 14.7 | 31 | 625 | | 80 | | | | | | | | | | |
| 0536 | | | | 2.4 | 14.6 | 27 | 626 | | 78 | | | | | | | | | 463 | |
| 0551 | | | | 2.7 | 14.6 | 26 | 606 | | 79 | | | | | | | | | | |
| 0606 | | | | 2.4 | 15.0 | 25 | 620 | | 80 | | | | | | | | | 468 | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

ACUREX
Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-10-84 (cont.)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED |  |  |  |  |  |  | CORRECTED TO 3% O2 DRY |  |  | HYDROCARBONS (HC) |  |  | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC |  |  |  |
| 0621 |  |  |  | 2.9 | 14.2 | 25 | 617 |  | 76 |  |  |  |  |  |  |  |  |  |  |
| 0636 |  |  |  | 3.0 | 14.1 | 24 | 612 |  | 74 |  |  |  |  |  |  |  |  | 471 |  |
| 0651 |  |  |  | 2.8 | 14.3 | 25 | 626 |  | 80 |  |  |  |  |  |  |  |  |  |  |
| 0700 span |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| internal/external + |  |  |  | +0.1 | +0.2 | +10 | +10 |  | +0.5 |  |  |  |  |  |  |  |  |  | zero |
| calibration |  |  |  | 6.1 | 18.3 | 180 | 491 |  | 90 |  |  |  |  |  |  |  |  |  | span |
|  |  |  |  | 7.2 | 18.0 | 185 |  |  | 90.1 |  |  |  |  |  |  |  |  |  | span gas |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0750 start |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0806 |  |  |  | 2.8 | 14.2 | 20 | 674 |  | 75 |  |  |  |  |  |  |  |  | 468 |  |
| 0821 |  |  |  | 2.9 | 14.6 | 22 | 648 |  | 64 |  |  |  |  |  |  |  |  |  |  |
| 0836 |  |  |  | 3.3 | 14.5 | 20 | 648 |  | 66 |  |  |  |  |  |  |  |  | 465 |  |
| 0851 |  |  |  | 3.3 | 14.3 | 26 | 639 |  | 65 |  |  |  |  |  |  |  |  |  |  |
| 0906 |  |  |  | 3.6 | 14.0 | 44 | 612 |  | 66 |  |  |  |  |  |  |  |  | 473 |  |
| 0921 |  |  |  | 3.6 | 13.9 | 29 | 621 |  | 70 |  |  |  |  |  |  |  |  |  |  |
| 0936 |  |  |  | 3.3 | 14.2 | 21 | 621 |  | 65 |  |  |  |  |  |  |  |  | 473 |  |
| 0951 |  |  |  | 3.2 | 14.1 | 25 | 622 |  | 61 |  |  |  |  |  |  |  |  |  |  |
| 1006 |  |  |  | 3.6 | 14.0 | 21 | 609 |  | 58 |  |  |  |  |  |  |  |  | 484 |  |
| 1021 |  |  |  | 3.3 | 13.8 | 25 | 608 |  | 56 |  |  |  |  |  |  |  |  |  |  |
| 1036 |  |  |  | 3.5 | 13.8 | 16 | 632 |  | 54 |  |  |  |  |  |  |  |  | 487 |  |
| 1051 |  |  |  | 3.5 | 13.3 | 13 | 606 |  | 54 |  |  |  |  |  |  |  |  |  |  |
| 1106 |  |  |  | 3.3 | 13.8 | 21 | 626 |  | 61 |  |  |  |  |  |  |  |  | 489 |  |
| 1121 |  |  |  | 3.4 | 13.9 | 10 | 617 |  | 61 |  |  |  |  |  |  |  |  |  |  |
| 1136 |  |  |  | 3.4 | 13.9 | 15 | 615 |  | 62 |  |  |  |  |  |  |  |  | 496 |  |
| 1151 |  |  |  | 3.6 | 13.8 | 10 | 612 |  | 53 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | AVERAGE |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

ACUREX
Aerotherm

# FIELD DATA SHEET

Plant
Location
Operator
Date 2-10-84 (cont.)
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1206 | | | | 3.3 | 13.7 | 13 | 624 | | 54 | | | | | | | | | 498 | |
| 1221 | | | | 3.4 | 13.9 | 12 | 617 | | 54 | | | | | | | | | | |
| 1236 | | | | 3.3 | 14.1 | 9 | 624 | | 57 | | | | | | | | | 491 | |
| 1251 | | | | 3.5 | 13.8 | 21 | 630 | | 56 | | | | | | | | | | |
| 1306 | | | | 3.3 | 14.1 | 16 | 631 | | 53 | | | | | | | | | 485 | |
| 1321 | | | | 3.3 | 13.9 | 13 | 633 | | 54 | | | | | | | | | | |
| 1336 | | | | 3.6 | 13.8 | 14 | 611 | | 53 | | | | | | | | | 497 | |
| 1351 | | | | 3.7 | 13.8 | 9 | 615 | | 53 | | | | | | | | | | |
| 1406 | | | | 3.5 | 13.9 | 14 | 615 | | 55 | | | | | | | | | 498 | |
| 1430 | internal span | | | | | | | | | | | | | | | | | | |
| | and cal | | | 0.0 | 0.0 | -5 | 0 | | 0 | | | | | | | | | | zero |
| | | | | 6.9 | 18.4 | 180 | 561 | | 80 | | | | | | | | | | span |
| | | | | 7.2 | 18.0 | 185 | 548 | | 90.1 | | | | | | | | | | span gas |
| 1440 | Start | | | | | | | | | | | | | | | | | | |
| 1451 | | | | 3.5 | 13.4 | 14 | 633 | | 66 | | | | | | | | | | |
| 1506 | | | | 3.4 | 13.6 | 11 | 626 | | 61 | | | | | | | | | 500 | |
| 1521 | | | | 3.8 | 13.5 | 10 | 612 | | 56 | | | | | | | | | | |
| 1536 | | | | 3.6 | 13.6 | 19 | 579 | | 62 | | | | | | | | | 500 | |
| 1551 | | | | 3.6 | 13.6 | 9 | 593 | | 60 | | | | | | | | | | |
| 1606 | | | | 3.3 | 13.6 | 6 | 591 | | 61 | | | | | | | | | 498 | |
| 1621 | | | | 3.6 | 13.6 | 12 | 591 | | 62 | | | | | | | | | | |
| 1636 | | | | 3.6 | 13.6 | 11 | 589 | | 65 | | | | | | | | | 499 | |
| 1651 | | | | 3.8 | 13.4 | 14 | 593 | | 66 | | | | | | | | | | |
| 1706 | | | | 3.8 | 13.4 | 15 | 576 | | 63 | | | | | | | | | 500 | |
| 1721 | | | | 2.7 | 13.1 | 9 | 572 | | 60 | | | | | | | | | | |
| 1736 | | | | 2.9 | 13.0 | 9 | 559 | | 54 | | | | | | | | | 499 | AVERAGE |
| 1751 | | | | 3.1 | 13.0 | 15 | 585 | | 56 | | | | | | | | | | } autodata paper |
| 1806 | | | | 3.1 | 13.4 | 15 | 600 | | 59 | | | | | | | | | | } ran out |

↓
strip chart

032 1/82

ACUREX Aerotherm

# FIELD DATA SHEET

Plant

Location

Operator

Date 2-10-84

Load Range

Ambient Temperature

Barometric Pressure

Static Pressure Duct

Fuel

← strip chart

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1821 | | | | 3.1 | 13.6 | 15 | 600 | | 61 | | | | | | | | | | |
| 1836 | | | | 3.1 | 13.6 | 15 | 600 | | 62 | | | | | | | | | | |
| 1851 | | | | 3.0 | 13.6 | 15 | 600 | | 65 | | | | | | | | | | |
| 1906 | | | | 2.9 | 13.6 | 15 | 608 | | 67 | | | | | | | | | | |
| 1921 | | | | 2.9 | 13.6 | 15 | 610 | | 68 | | | | | | | | | | |
| 1936 | | | | 2.7 | 13.6 | 15 | 610 | | 68 | | | | | | | | | | |
| 1951 | | | | 2.6 | 13.6 | 15 | 605 | | 67 | | | | | | | | | | |
| 2006 | | | | 2.7 | 13.6 | 15 | 610 | | 65 | | | | | | | | | | |
| 2021 | | | | 2.7 | 13.6 | 15 | 613 | | 63 | | | | | | | | | | |
| 2036 | | | | 2.8 | 14.2 | 10 | 630 | | 65 | | | | | | | | | 482 | |
| 2051 | | | | 3.2 | 14.0 | 12 | 633 | | 66 | | | | | | | | | | |
| 2106 | | | | 2.8 | 14.4 | 11 | 638 | | 69 | | | | | | | | | 487 | |
| 2121 | | | | 3.0 | 14.3 | 8 | 634 | | 73 | | | | | | | | | | |
| 2136 | | | | 2.9 | 14.3 | 12 | 639 | | 79 | | | | | | | | | 484 | |
| 2151 | | | | 2.3 | 14.7 | 14 | 647 | | 77 | | | | | | | | | | |
| 2206 | | | | 2.9 | 14.6 | 18 | 634 | | 80 | | | | | | | | | 473 | |
| 2221 | | | | 2.4 | 14.6 | 33 | 640 | | 76 | | | | | | | | | | |
| 2236 | | | | 2.8 | 14.1 | 5 | 647 | | 75 | | | | | | | | | 471 | |
| 2251 | | | | 2.9 | 14.3 | 21 | 632 | | 72 | | | | | | | | | | |
| 2306 | | | | 2.7 | 14.2 | 12 | 637 | | 75 | | | | | | | | | 483 | |
| 2321 | | | | 3.3 | 13.8 | 12 | 632 | | 75 | | | | | | | | | | |
| 2336 | | | | 2.8 | [illegible] | 13 | 622 | | 81 | | | | | | | | | 487 | |
| 2351 | | | | 3.2 | 13.9 | 19 | 624 | | 74 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)
Location SUS 69
Operator M.LBURN
Date 2-11-84
Load Range

Ambient Temperature 62°F
Barometric Pressure 29.40
Static Pressure Duct
Fuel Lease Crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0006 | | | | 2.9 | 14.0 | 11 | 632 | | 74 | | | | | | | | | 487 | Calibration Gasses |
| 0021 | | | | 2.8 | 14.1 | 7 | 638 | | 75 | | | | | | | | | | $CO_2$ 18.15 % |
| 0036 | | | | 3.1 | 13.9 | 8 | 612 | | 72 | | | | | | | | | 490 | $O_2$ 7.25 % |
| 0051 | | | | 3.0 | 14.0 | 22 | 608 | | 76 | | | | | | | | | | CO 184 ppm |
| 0106 | | | | 2.8 | 13.9 | 3 | 623 | | 72 | | | | | | | | | 488 | $SO_2$ 548 ppm |
| 0121 | | | | 3.0 | 14.0 | 17 | 636 | | 74 | | | | | | | | | | $NO_x$ 90.1 ppm |
| 0136 | | | | 3.1 | 14.0 | 9 | 643 | | 73 | | | | | | | | | 477 | |
| 0151 | | | | 2.7 | 14.4 | 20 | 633 | | 76 | | | | | | | | | | |
| 0206 | | | | 2.4 | 14.4 | 18 | 639 | | 78 | | | | | | | | | 476 | |
| 0221 | | | | 2.4 | 14.1 | 18 | 642 | | 76 | | | | | | | | | | |
| 0236 | | | | 2.8 | 13.3 | 11 | 635 | | 75 | | | | | | | | | 477 | |
| 0251 | | | | | | | | | | | | | | | | | | | |
| | | | | Flow loss | | | | | | | | | | | | | | | |
| 0830 | internal span | | | | | | | | | | | | | | | | | | |
| | internal & external | | | 0.0 | | | | | 0 | | | | | | | | | | zero |
| | Cal | | | 6.85 | | | | | | | | | | | | | | | span |
| | | | | | | | | | | | | | | | | | | | span gas |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

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ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)
Location SVS -69
Operator C. Milburn
Date 2-11-84
Load Range

Ambient Temperature 62°F
Barometric Pressure 29.40
Static Pressure Duct
Fuel Lease Crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0906 | | | | 2.6 | 14.9 | 10.0 | 707 | | 75 | | | | | | | | | 481 | Restart 0900 |
| 0921 | | | | 2.9 | 14.5 | 19.0 | 685 | | 69.5 | | | | | | | | | | |
| 0936 | | | | 2.7 | 14.8 | 21.0 | 683 | | 69.1 | | | | | | | | | 495 | |
| 0951 | | | | 2.5 | 14.7 | 15.6 | 688 | | 70.6 | | | | | | | | | | |
| 1006 | | | | 2.7 | 14.7 | 10.3 | 698 | | 64.7 | | | | | | | | | 502 | |
| 1021 | | | | 3.0 | 14.5 | 12.9 | 693 | | 65.8 | | | | | | | | | | |
| 1036 | | | | 2.8 | 14.7 | 17.0 | 709 | | 65.9 | | | | | | | | | 505 | |
| 1051 | | | | 2.5 | 14.8 | 15.0 | 714 | | 65.7 | | | | | | | | | | |
| 1106 | | | | 2.6 | 14.6 | 9.9 | 714 | | 63.3 | | | | | | | | | 507 | |
| 1121 | | | | 2.7 | 14.5 | 14.9 | 706 | | 63.3 | | | | | | | | | | |
| 1136 | | | | 2.5 | 14.7 | 16.9 | 707 | | 62.7 | | | | | | | | | 510 | |
| 1151 | | | | 2.8 | 14.6 | 13.6 | 697 | | 62.3 | | | | | | | | | | |
| 1206 | | | | 2.9 | 14.6 | 13.4 | 704 | | 65.1 | | | | | | | | | 514 | |
| 1221 | | | | 2.8 | 14.4 | 7.2 | 701 | | 65.7 | | | | | | | | | | |
| 1236 | | | | 2.9 | 14.4 | 14.6 | 698 | | 66.7 | | | | | | | | | 517 | |
| 1251 | | | | 2.8 | 14.5 | 8.0 | 700 | | 66.0 | | | | | | | | | | |
| 1306 | | | | 2.7 | 14.5 | 15.1 | 707 | | 65.6 | | | | | | | | | 516 | |
| 1321 | | | | 2.8 | 14.6 | 19.7 | 698 | | 66.9 | | | | | | | | | | |
| 1336 | | | | 2.9 | 14.5 | 12.8 | 706 | | 67.8 | | | | | | | | | 510 | |
| 1351 | | | | 2.7 | 14.5 | 15.5 | 686 | | 65.4 | | | | | | | | | | |
| 1406 | | | | 2.9 | 14.2 | 14.8 | 666 | | 63.7 | | | | | | | | | 510 | |
| 1421 | | | | 2.7 | 14.3 | 19.0 | 662 | | 63.6 | | | | | | | | | | |
| 1436 | | | | 2.9 | 14.5 | 20.4 | 651 | | 63.3 | | | | | | | | | 509 | |
| 1451 | | | | 2.8 | 14.1 | 13.7 | 635 | | 63.6 | | | | | | | | | | |
| 1506 | | | | 2.7 | 14.1 | 22.5 | 624 | | 62.3 | | | | | | | | | 507 | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

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# FIELD DATA SHEET

ACUREX Aerotherm

Plant Chevron (EER)
Location SUS 69
Operator C. McLBurn
Date 2-11-84
Load Range

Ambient Temperature 62°F
Barometric Pressure 29.40
Static Pressure Duct
Fuel lease Crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1521 | | | | | | | | | | | | | | | | | | | Calibrate 1520-1530 |
| 1536 | | | | 2.7 | 14.2 | 14.7 | 594 | | 62.8 | | | | | | | | | 505 | O2 zero 0% SPAN 7.0% |
| 1551 | | | | 2.6 | 14.4 | 25.8 | 579 | | 63.4 | | | | | | | | | | CO2 " 0% " 17.9% |
| 1606 | | | | 2.6 | 14.3 | 18.4 | 643 | | 61.1 | | | | | | | | | 502 | CO " 60ppm " 220ppm |
| 1621 | | | | 2.7 | 13.8 | 26.9 | 630 | | 62.1 | | | | | | | | | | SO2 " 10.1ppm " 490 ppm |
| 1636 | | | | 2.6 | 13.5 | 20.9 | 632 | | 65.9 | | | | | | | | | 506 | NOx " 0ppm " 89ppm |
| 1651 | | | | 2.6 | 13.5 | 15.7 | 634 | | 65.4 | | | | | | | | | | |
| 1706 | | | | 2.5 | 13.6 | 24.7 | 638 | | 65.2 | | | | | | | | | 506 | recAl |
| 1721 | | | | 2.4 | 13.6 | 19.3 | 639 | | 64.9 | | | | | | | | | | |
| 1736 | | | | 2.3 | 14.0 | 18.4 | 650 | | 41.6 | | | | | | | | | 500 | |
| 1751 | | | | 2.5 | 14.0 | 25.2 | 648 | | → | → | | | | | | | | → | NOx lost Sample Flow |
| 1806 | | | | 2.7 | 13.6 | 17.7 | 642 | | | | | | | | | | | 501 | |
| 1821 | | | | 2.7 | 13.8 | 18.0 | 660 | | | | | | | | | | | | |
| 1836 | | | | 2.9 | 13.7 | 18.6 | 686 | | | | | | | | | | | 492 | |
| 1851 | | | | 2.[illegible] | 139 | 14.0 | 679 | | | | | | | | | | | | |
| 1906 | | | | 2.6 | 13.8 | 19.1 | 681 | | | | | | | | | | | 490 | |
| 1921 | | | | 2.8 | 13.6 | 16.6 | 683 | | | | | | | | | | | | |
| 1936 | | | | 2.5 | 13.8 | 19.6 | 700 | | | | | | | | | | | 491 | |
| 1951 | | | | 2.5 | 14.6 | 16.8 | 699 | | 67.9 | | | | | | | | | | |
| 2006 | | | | 2.4 | 14.6 | 20.2 | 692 | | 74.2 | | | | | | | | | 499 | |
| 2021 | | | | 2.6 | 14.6 | 9.5 | 707 | | 69.9 | | | | | | | | | | |
| 2036 | | | | 2.7 | 14.5 | 20.7 | 713 | | 68.6 | | | | | | | | | 504 | |
| 2051 | | | | 2.4 | 14.8 | 10.8 | 733 | | 73.4 | | | | | | | | | | |
| 2106 | | | | 2.4 | 15.0 | 17.5 | 731 | | 75.3 | | | | | | | | | 497 | |
| 2121 | | | | 2.4 | 15.0 | 17.8 | 731 | | 783 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (EER)

Location SUS 69

Operator C. Milburn

Date 2-11-84

Load Range

Ambient Temperature 62° F

Barometric Pressure 29.40

Static Pressure Duct

Fuel lease Crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 2136 | | | | 2.2 | 15.2 | 11.8 | 747 | | 77.7 | | | | | | | | | 489 | |
| 2151 | | | | 2.4 | 15.0 | 6.9 | 735 | | 72.3 | | | | | | | | | | |
| 2206 | | | | 2.4 | 14.8 | 17.0 | 743 | | 77.8 | | | | | | | | | 490 | |
| 2221 | | | | 2.5 | 15.0 | 17.9 | 723 | | 74.6 | | | | | | | | | | |
| 2236 | | | | 2.8 | 14.6 | 10.0 | 715 | | | | | | | | | | | 496 | |
| 2251 | | | | 2.4 | 14.8 | 13.1 | 742 | | | | | | | | | | | | |
| 2306 | | | | 2.4 | 14.9 | 18.4 | 727 | | | | | | | | | | | 494 | |
| 2321 | | | | 2.8 | 14.6 | 15.9 | 714 | | | | | | | | | | | | |
| 2336 | | | | 2.5 | 14.6 | 21.0 | 729 | | | | | | | | | | | 492 | |
| 2351 | | | | 2.8 | 12.9 | 9.9 | 713 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

**ACUREX Aerotherm**

# FIELD DATA SHEET

Plant Chevron (EER)
Location SUS 69
Operator C. Milburn
Date 2-12-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel Lease Crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0006 | | | | 1.7 | 13.5 | 36.6 | 786 | | [illegible] | | | | | | | | | 483 | lost Nox Flow |
| 0021 | | | | 2.7 | 13.5 | 15.8 | 713 | | | | | | | | | | | | |
| 0036 | | | | 2.6 | 13.2 | 204 | 718 | | | | | | | | | | | 492 | |
| 0051 | | | | 2.6 | 13.3 | 34.5 | 722 | | | | | | | | | | | | 2550 SPAN |
| 0106 | | | | 2.8 | 13.5 | 13.4 | 701 | | | | | | | | | | | 493 | O2 .1% 6.85% |
| 0121 | | | | 2.6 | 13.3 | 18.6 | 703 | | | | | | | | | | | | CO2 .1% 18.15% |
| 0136 | | | | 2.1 | 13.5 | 20.1 | 735 | | | | | | | | | | | 484 | CO 10ppm 180ppm |
| 0151 | | | | 2.8 | 12.5 | 18.4 | 712 | | | | | | | | | | | | SO2 3ppm 435ppm |
| 0206 | | | | 2.7 | 13.0 | 20.1 | 611 | | | | | | | | | | | 484 | NOx 0ppm 88ppm |
| 0221 | | | | 2.8 | 12.5 | 31.9 | 672 | | | | | | | | | | | | |
| 0236 | | | | 2.4 | 13.0 | 222 | 580 | | | | | | | | | | | 491 | |
| 0251 | | | | 2.7 | 12.7 | 30.2 | 662 | | | | | | | | | | | | |
| 0306 | | | | 2.7 | 12.8 | 29.4 | 611 | | | | | | | | | | | 484 | |
| 0321 | | | | 2.6 | 12.6 | 33.7 | 634 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | LOST | Flow | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 0750: They Shut |
| | | | | | | | | | | | | | | | | | | | down the Generator |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (eer)
Location SUS 69
Operator C.Milburn
Date 2-15-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 1703 | | | | 3.3 | 13.5 | | 558 | | 69.7 | | | | | | | | | 445 | Generator came |
| 1718 | | | | 2.8 | 14.3 | | 575 | | 77.0 | | | | | | | | | | Back on At 1350 |
| 1733 | | | | 2.9 | 13.7 | | 549 | | 75.6 | | | | | | | | | 447 | 2-15-84 |
| 1748 | | | | 3.0 | 13.3 | | 543 | | 72.8 | | | | | | | | | | |
| 1803 | | | | 2.9 | 13.3 | | 554 | | 72.3 | | | | | | | | | 446 | Lost Co Moniter |
| 1818 | | | | 2.9 | 13.2 | | 557 | | 62.2 | | | | | | | | | | |
| 1833 | | | | 3.1 | 13.0 | | 550 | | 61.8 | | | | | | | | | 459 | O2 Subject to |
| 1848 | | | | 3.1 | 13.3 | | 555 | | 61.2 | | | | | | | | | | drift |
| 1903 | | | | 3.0 | 13.3 | | 557 | | 59.9 | | | | | | | | | 463 | |
| 1918 | | | | 3.2 | 13.4 | | 560 | | | | | | | | | | | | NOx Analizer wentdown |
| 1933 | | | | 3.2 | 13.6 | | 559 | | | | | | | | | | | 465 | |
| 1948 | | | | 3.3 | 13.9 | | 556 | | | | | | | | | | | | Cal Gasses |
| 2003 | | | | 3.2 | 14.5 | | 565 | | | | | | | | | | | 466 | |
| 2018 | | | | 3.2 | 14.5 | | 565 | | | | | | | | | | | | CO2 18.15 % |
| 2033 | | | | 3.3 | 14.6 | | 560 | | | | | | | | | | | | O2 7.25 % |
| 2048 | | | | 3.5 | 13.9 | | 562 | | 61.9 | | | | | | | | | 466 | SO2 548 ppm |
| 2103 | | | | 3.4 | 13.8 | | 540 | | 60.4 | | | | | | | | | | NOx 90.1 ppm |
| 2118 | | | | 3.2 | 14.1 | | 548 | | 62.4 | | | | | | | | | | |
| 1233 | | | | 3.3 | 14.3 | | 560 | | 62.0 | | | | | | | | | 468 | |
| 2148 | | | | 3.3 | 14.3 | | 565 | | 61.5 | | | | | | | | | | |
| 2203 | | | | 3.2 | 14.5 | | 564 | | 63.1 | | | | | | | | | 467 | |
| 2218 | | | | 3.3 | 14.4 | | 564 | | 65.2 | | | | | | | | | | |
| 2233 | | | | 3.4 | 14.4 | | 565 | | 63.9 | | | | | | | | | 469 | |
| 2248 | | | | 3.4 | 14.3 | | 560 | | 64.9 | | | | | | | | | | |
| 2303 | | | | 3.3 | 14.4 | | 554 | | 63.8 | | | | | | | | | 469 | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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**ACUREX Aerotherm**

# FIELD DATA SHEET

Plant Chevron (eer)
Location SUS 69
Operator C. Millburn
Date 2-15-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 2318 | | | | 3.3 | 14.3 | | 555 | | 60.5 | | | | | | | | | 465 | |
| 2333 | | | | 3.0 | 14.7 | | 635 | | 59.7 | | | | | | | | | | |
| 2348 | | | | 3.2 | 14.4 | | 554 | | 61.3 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

# FIELD DATA SHEET

ACUREX Aerotherm

Plant Chevron (eer)
Location SUS 69
Operator C. Milburn
Date 2-16-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0003 | | | | 3.0 | 14.6 | | 584 | | 59.5 | | | | | | | | | 463 | CalGas |
| 0018 | | | | 3.2 | 14.4 | | 519 | | 59.5 | | | | | | | | | | $O_2$=7.20% |
| 0033 | | | | 2.9 | 14.5 | | 623 | | 59.5 | | | | | | | | | 462 | $CO_2$=18.04% |
| 0048 | | | | 2.8 | 14.6 | | 613 | | 60.3 | | | | | | | | | | $SO_2$=548 ppm |
| 0103 | | | | 3.3 | 14.3 | | 596 | | 58.3 | | | | | | | | | 468 | $NO_x$=90.1 ppm |
| 0118 | | | | 3.1 | 14.3 | | 573 | | 60.2 | | | | | | | | | | |
| 0133 | | | | 3.1 | 14.3 | | 565 | | 59.7 | | | | | | | | | 465 | [$O_2$ off strip chart] |
| 0148 | | | | 3.3 | 13.9 | | 545 | | 60.9 | | | | | | | | | | |
| 0203 | | | | 3.4 | 14.0 | | 534 | | 63.6 | | | | | | | | | 470 | |
| 0218 | | | | 3.3 | 14.0 | | 542 | | 63.2 | | | | | | | | | | SPAN check |
| 0233 | | | | 3.3 | 14.1 | | 540 | | 62.9 | | | | | | | | | 468 | |
| 0248 | | | | 3.3 | 14.2 | | 554 | | 60.7 | | | | | | | | | | zero SPAN |
| 0303 | | | | 3.4 | 14.2 | | 557 | | 62.5 | | | | | | | | | 471 | $O_2$ 0% 4.4% |
| 0318 | | | | 3.3 | 14.3 | | 556 | | 62.6 | | | | | | | | | | $CO_2$ |
| 0333 | | | | 3.3 | 14.3 | | 557 | | 63.6 | | | | | | | | | 467 | $SO_2$ |
| 0348 | | | | 3.2 | 14.3 | | 560 | | 62.9 | | | | | | | | | | $NO_x$ .3 ppm 86 ppm |
| 0403 | | | | 3.2 | 14.2 | | 566 | | 65.5 | | | | | | | | | 467 | |
| 0418 | | | | 3.2 | 14.3 | | 566 | | 65.5 | | | | | | | | | | |
| 0433 | | | | 3.2 | 14.5 | | 569 | | 68.5 | | | | | | | | | 460 | |
| 0448 | | | | 3.2 | 14.4 | | 571 | | 65.8 | | | | | | | | | | |
| 0503 | | | | 3.2 | 14.4 | | 553 | | 66.5 | | | | | | | | | 459 | |
| 0518 | | | | 3.2 | 14.2 | | 559 | | 69.0 | | | | | | | | | | |
| 0533 | | | | 3.2 | 14.1 | | 529 | | 68.9 | | | | | | | | | 461 | |
| 0548 | | | | 3.2 | 13.9 | | 531 | | 71.8 | | | | | | | | | | |
| 0603 | | | | 3.2 | 13.9 | | 483 | | 71.6 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

# FIELD DATA SHEET

ACUREX Aerotherm

Plant Cheron (ear)
Location SUS 69
Operator C. Milburn
Date 2-16-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0618 | | | | 3.2 | 13.7 | | 545 | | 67.5 | | | | | | | | | | |
| 0633 | | | | 3.2 | 13.8 | | 551 | | 72.0 | | | | | | | | | 452 | |
| 0648 | | | | 3.3 | 13.7 | | 519 | | 79.1 | | | | | | | | | | |
| 0703 | | | | 3.3 | 13.8 | | 534 | | 80.8 | | | | | | | | | 449 | |
| 0718 | | | | 3.2 | 13.8 | | 528 | | 83.7 | | | | | | | | | | |
| 0733 | | | | 3.1 | 13.7 | | 534 | | 84.8 | | | | | | | | | 453 | |
| 0748 | | | | 3.3 | 13.8 | | 539 | | 81.7 | | | | | | | | | | |
| 0803 | | | | 3.3 | 13.9 | | 555 | | 83.4 | | | | | | | | | 450 | |
| 0818 | | | | | Test over | | | | | | | | | | | | | | |
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032 1/82

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron
Location SUS-69
Operator Milburn
Date 2-22-84
Load Range

Ambient Temperature 63°F
Barometric Pressure 29.40
Static Pressure Duct
Fuel Lease Crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1029 | | | | 3.2 | 12.7 | | 648 | | 72.1 | | | | | | | | | 543 | 1029 to 1344 OFF - |
| 1044 | | | | 2.9 | 14.1 | | 645 | | 72.6 | | | | | | | | | | strip charts - NO |
| 1059 | | | | 3.2 | 12.7 | | 636 | | 78.6 | | | | | | | | | 546 | Autodata paper. |
| 1114 | | | | 3.0 | 10.0 | | 637 | | 80.1 | | | | | | | | | | |
| 1129 | | | | 3.0 | 15.9 | | 629 | | 80.9 | | | | | | | | | 553 | Cal Gasses |
| 1144 | | | | 3.1 | 15.0 | | 627 | | 82.0 | | | | | | | | | | $O_2$ 7.20 % |
| 1159 | | | | 3.0 | 13.0 | | 622 | | 82.1 | | | | | | | | | 559 | Nox 90.1 ppm |
| 1214 | | | | 3.1 | 10.1 | | 621 | | 80.0 | | | | | | | | | | $SO_2$ 530 ppm - I could |
| 1229 | | | | 2.9 | 8.8 | | 619 | | 77.2 | | | | | | | | | 556 | not reach the |
| 1244 | | | | 3.0 | 16.7 | | 631 | | 75.7 | | | | | | | | | | SPAN of 548 Becouse |
| 1259 | | | | 3.0 | 16.9 | | 617 | | 75.5 | | | | | | | | | 553 | The Instoment wouldnot |
| 1314 | | | | 2.5 | 15.0 | | 606 | | 75.0 | | | | | | | | | | SPAN. |
| 1329 | | | | 2.4 | 15.0 | | 651 | | 71.7 | | | | | | | | | | $CO_2$ 18.04 % |
| 1344 | | | | 2.5 | 14.2 | | 660 | | 70.0 | | | | | | | | | | |
| 1359 | | | | 2.6 | 14.3 | | 637 | | 68.8 | | | | | | | | | 532 | SPAN check |
| 1414 | | | | 2.5 | 13.8 | | 640 | | 68.6 | | | | | | | | | | $O_2$ zero 0% SPAN 6.45% |
| 1429 | | | | 2.6 | 13.3 | | 645 | | 71.7 | | | | | | | | | 529 | Nox 0 ppm 86.3 ppm |
| 1444 | | | | 2.3 | 13.0 | | 661 | | 71.4 | | | | | | | | | | $SO_2$ 4 ppm 523 ppm |
| 1459 | | | | End test | | | | | | | | | | | | | | | $CO_2$ -.2% 16.2% |
| | | | | restart 1500 | | | | | | | | | | | | | | | |
| 1514 | | | | 2.7 | 14.3 | | 654 | | 67.3 | | | | | | | | | | |
| 1529 | | | | 2.5 | 14.4 | | 680 | | 74.5 | | | | | | | | | | |
| 1544 | | | | 2.4 | 13.9 | | 683 | | 73.1 | | | | | | | | | | |
| 1559 | | | | 2.7 | 13.5 | | 665 | | 70.8 | | | | | | | | | | |
| 1614 | | | | 2.8 | 13.4 | | 670 | | 67.0 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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**ACUREX Aerotherm**

# FIELD DATA SHEET

Plant Chevron (CEER)
Location SUS 69
Operator C. Milburn
Date 2-22-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 1629 | | | | 2.7 | 13.4 | | 664 | | 70.0 | | | | | | | | | | |
| 1644 | | | | 2.5 | 13.4 | | 689 | | 76.9 | | | | | | | | | | |
| 1659 | | | | 2.8 | 13.1 | | 662 | | 74.1 | | | | | | | | | | |
| 1714 | | | | 2.8 | 13.0 | | 671 | | 74.0 | | | | | | | | | | |
| 1729 | | | | 2.8 | 13.0 | | 678 | | 76.2 | | | | | | | | | | |
| 1744 | | | | 2.7 | 13.1 | | 681 | | 76.7 | | | | | | | | | | |
| 1759 | | | | 3.1 | 12.8 | | 660 | | 70.0 | | | | | | | | | | |
| 1814 | | | | 2.6 | 13.2 | | 685 | | 71.2 | | | | | | | | | | |
| 1829 | | | | 2.7 | 13.2 | | 684 | | 68.0 | | | | | | | | | | |
| 1844 | | | | 2.8 | 13.3 | | 675 | | 69.1 | | | | | | | | | | |
| 1859 | | | | 2.9 | 13.3 | | 677 | | 64.6 | | | | | | | | | | |
| 1914 | | | | 2.7 | 13.6 | | 686 | | 74.9 | | | | | | | | | | |
| 1929 | | | | 2.8 | 13.6 | | 683 | | 72.8 | | | | | | | | | | |
| 1944 | | | | 2.8 | 13.7 | | 688 | | 73.8 | | | | | | | | | | |
| 1959 | | | | Drain Impingers | | | | | | | | | | | | | | | |
| 2014 | | | | 2.3 | 13.6 | | 724 | | 72.5 | | | | | | | 0 | | | |
| 2029 | | | | 2.8 | 13.6 | | 689 | | 72.8 | | | | | | | 0 | | | |
| 2044 | | | | 2.6 | 13.5 | | 692 | | 70.3 | | | | | | | 0 | | | |
| 2059 | | | | 2.6 | 13.2 | | 689 | | 67.8 | | | | | | | 0 | | | |
| 2114 | | | | 2.7 | 13.0 | | 690 | | 66.0 | | | | | | | 0 | | | |
| 2129 | | | | 2.5 | 12.9 | | 698 | | 68.9 | | | | | | | 0 | | | |
| 2144 | | | | 2.7 | 12.7 | | 692 | | 64.5 | | | | | | | 0 | | | |
| 2159 | | | | 2.6 | 12.6 | | 683 | | 66.2 | | | | | | | 0 | | | |
| 2214 | | | | 2.5 | 12.6 | | 688 | | 68.7 | | | | | | | 0 | | | |
| 2229 | | | | 2.7 | 12.2 | | 686 | | 71.4 | | | | | | | 0 | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
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ACUREX
Aerotherm

# FIELD DATA SHEET

Plant Chevron (oer)
Location SVS 69
Operator C. Milburn
Date 2-22-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 2244 | | | | 2.8 | 11.8 | | 671 | | 70.9 | | | | | | | 0 | | | |
| 2259 | | | | 2.7 | 11.7 | | 672 | | 73.2 | | | | | | | 0 | | | |
| 2314 | | | | 2.7 | 11.5 | | 671 | | 72.0 | | | | | | | 0 | | | |
| 2329 | | | | 2.7 | 11.4 | | 667 | | 72.3 | | | | | | | 0 | | | |
| 2344 | | | | 2.7 | 11.4 | | 666 | | 75.0 | | | | | | | 0 | | | |
| 2359 | | | | 2.6 | 11.3 | | 664 | | 74.8 | | | | | | | 0 | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron

Location SUS - 69

Operator McLburn

Date 2-23-84

Load Range

Ambient Temperature 63°F

Barometric Pressure 29.40

Static Pressure Duct

Fuel Lease Crude

| | | | | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
| 0014 | | | | 2.6 | 11.1 | | 670 | | 72.6 | | | | | | | 0 | | | |
| 0029 | | | | 2.9 | 10.9 | | 659 | | 70.9 | | | | | | | 0 | | | |
| 0044 | | | | 2.7 | 11.0 | | 679 | | 72.7 | | | | | | | 0 | | | |
| 0059 | | | | 2.7 | 10.8 | | 678 | | 68.6 | | | | | | | 0 | | | |
| 0114 | | | | 2.7 | 10.7 | | 680 | | 73.1 | | | | | | | 0 | | | |
| 0129 | | | | 2.7 | 10.5 | | 666 | | 72.0 | | | | | | | 0 | | | |
| 0144 | | | | 2.8 | 10.3 | | 660 | | 72.8 | | | | | | | 0 | | | |
| 0159 | | | | 2.8 | 10.1 | | 663 | | 75.5 | | | | | | | 0 | | | |
| 0214 | | | | 2.8 | 10.2 | | 660 | | 75.4 | | | | | | | 0 | | | |
| 0229 | | | | 2.9 | 10.0 | | 652 | | 76.4 | | | | | | | 0 | | | |
| 0244 | | | | 2.8 | 9.8 | | 664 | | 76.0 | | | | | | | 0 | | | |
| 0259 | | | | 2.7 | 9.8 | | 668 | | 72.2 | | | | | | | 0 | | | |
| 0314 | | | | 2.5 | 9.8 | | 684 | | 71.6 | | | | | | | 0 | | | |
| 0329 | | | | 2.6 | 9.7 | | 680 | | 70.5 | | | | | | | 0 | | | |
| 0344 | | | | 2.7 | 9.5 | | 657 | | 69.8 | | | | | | | 0 | | | |
| 0359 | | | | 2.8 | 9.6 | | 674 | | 69.3 | | | | | | | 0 | | | |
| 0414 | | | | 2.9 | 9.4 | | 663 | | 65.9 | | | | | | | 0 | | | |
| 0429 | | | | 2.9 | 9.4 | | 660 | | 69.8 | | | | | | | 0 | | | |
| 0444 | | | | 2.9 | 9.3 | | 651 | | 67.8 | | | | | | | 0 | | | |
| 0459 | | | | 2.9 | 9.3 | | 660 | | 68.8 | | | | | | | 0 | | | |
| 0514 | | | | 3.1 | 9.2 | | 648 | | 72.8 | | | | | | | 0 | | | |
| 0529 | | | | 3.1 | 9.2 | | 656 | | 70.2 | | | | | | | 0 | | | |
| 0544 | | | | 3.1 | 9.2 | | 640 | | 70.8 | | | | | | | 0 | | | |
| 0559 | | | | 3.0 | 9.2 | | ~~[illegible]~~ 642 | | ~~[illegible]~~ 67.6 | | | | | | | 0 | | | |
| 0614 | | | | 3.0 | 9.1 | | 629 | | 67.5 | | | | | | | 0 | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

4-62

032 1/82

ACUREX Aerotherm

# FIELD DATA SHEET

Plant Chevron (eer)
Location SUS 69
Operator C. Nicburn
Date 2-23-84
Load Range

Ambient Temperature
Barometric Pressure
Static Pressure Duct
Fuel

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 0629 | | | | 3.1 | 8.9 | | 612 | | 70.6 | | | | | | | | | | O2 Subject to Drift |
| 0644 | | | | 3.0 | 8.9 | | 560 | | 67.9 | | | | | | | | | | zero SPAN |
| 0659 | | | | Test Over | | | | | | | | | | | | | | | O2 .1% 70% |
| | | | | restart | | | | | | | | | | | | | | | CO2 .05% 18.15 |
| 0859 | | | | 2.6 | 15.6 | | 608 | | 74.9 | | | | | | | | | | SO2 5ppm 495 |
| 0914 | | | | 2.7 | 15.8 | | 602 | | 76.7 | | | | | | | | | | NOx .[illegible]ppm 82 ppm |
| 0929 | | | | 2.8 | 16.9 | | 601 | | 75.9 | | | | | | | | | | |
| 0944 | | | | 2.9 | 16.3 | | 602 | | 70.6 | | | | | | | | | | |
| 0959 | | | | 2.9 | 17.6 | | 598 | | 70.1 | | | | | | | | | | |
| 1014 | | | | 2.8 | 18.5 | | 628 | | 68.7 | | | | | | | | | | |
| 1029 | | | | 3.3 | 14.5 | | 649 | | 72.9 | | | | | | | | | | |
| 1044 | | | | 3.3 | 14.7 | | 648 | | 72.6 | | | | | | | | | | |
| 1059 | | | | 3.3 | 12.5 | | 641 | | 72.3 | | | | | | | | | | |
| [illegible] | | | | 3.2 | 12.2 | | 657 | | 68.3 | | | | | | | | | | |
| 1129 | | | | → | 16.6 | | 477 | | → | | | | | | | | | 548 | Check O2 CAl |
| 1144 | | | | 3.5 | 14.6 | | 597 | | 69.1 | | | | | | | | | | |
| 1159 | | | | 3.5 | 16.4 | | 614 | | 69.5 | | | | | | | | | 549 | |
| 1214 | | | | 3.6 | 17.4 | | 621 | | 66.4 | | | | | | | | | | |
| 1229 | | | | 3.7 | 17.2 | | 631 | | 68.8 | | | | | | | | | 537 | |
| 1244 | | | | 3.7 | 14.0 | | 655 | | 69.2 | | | | | | | | | | |
| 1259 | | | | 4.0 | 14.5 | | 695 | | 65.9 | | | | | | | | | 545 | zero SPAN |
| 1314 | | | | 4.4 | 14.5 | | 649 | | 67.9 | | | | | | | | | | O2 0% 6.95% |
| 1329 | | | | 4.8 | 14.0 | | 626 | | 70.4 | | | | | | | | | 553 | CO2 0% 19.39 |
| 1344 | | | | 4.9 | 13.5 | | 634 | | 72.4 | | | | | | | | | | SO2 -16ppm 548ppm |
| 1359 | | | | | | | | | | | | | | | | | | | NOx 0ppm 86.5ppm |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

# FIELD DATA SHEET

ACUREX Aerotherm

Plant Chevron (EER)
Location SUS 69
Operator Milburn
Date 2-24-84
Load Range

Ambient Temperature 65°F
Barometric Pressure 29.40
Static Pressure Duct
Fuel Lease Crude

| Time | Sample Point | Load MW | Steam Flow lb/hr x1000 | DRY UNCORRECTED | | | | | | | CORRECTED TO 3% O2 DRY | | | HYDROCARBONS (HC) | | | $H_2O$ % | Stack Gas Temp °F | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $O_2$ % | $CO_2$ % | CO ppm | $SO_2$ ppm | NO ppm | $NO_x$ ppm | $NO_2$ ppmn | NO ppm | $NO_x$ ppm | $NO_2$ ppm | Total HC | Methane | Non-Methane HC | | | |
| 804 | | | | 2.2 | | | | | 75 | | | | | | | | | | O2 meter suspect to |
| 0950 | | | | 2.2 | 12.78 | | 689 | | 70.7 | | | | | | | | | 544 | Drift 0804-1244 |
| 1005 | | | | 2.2 | 13.26 | | 688 | | 71.3 | | | | | | | | | 535 | |
| 1020 | | | | 2.3 | 12.78 | | 641 | | 71.3 | | | | | | | | | 527 | |
| 1035 | | | | 2.6 | 13.12 | | 630 | | 70.1 | | | | | | | | | 535 | |
| 1040 | | | | 3.0 | 12.93 | | 627 | | 68.3 | | | | | | | | | 530 | |
| 1105 | | | | 3.1 | 12.50 | | 630 | | 70.0 | | | | | | | | | 531 | |
| 1120 | | | | 3.2 | 13.05 | | 632 | | 68.71 | | | | | | | | | 527 | |
| 1135 | | | | 3.3 | 12.34 | | 622 | | 69.92 | | | | | | | | | 527 | |
| 1150 | | | | 3.3 | 12.3 | | 622 | | 69.9 | | | | | | | | | | |
| 1205 | | | | 3.3 | 12.7 | | 637 | | 65.4 | | | | | | | | | 544 | |
| 1220 | | | | | 11.9 | | 637 | | 64.9 | | | | | | | | | | |
| 1235 | | | | | 12.6 | | 636 | | 69.1 | | | | | | | | | 547 | |
| 1250 | | | | 2.7 | 11.2 | | 635 | | 72.6 | | | | | | | | | | |
| 1305 | | | | 2.7 | 11.8 | | 632 | | 74.2 | | | | | | | | | 547 | O2 off strip chart |
| 1320 | | | | 2.7 | 11.8 | | 636 | | 71.8 | | | | | | | | | | |
| 1335 | | | | 2.6 | 12.2 | | 642 | | 70.4 | | | | | | | | | 549 | Zero span |
| 1350 | | | | 2.7 | 11.7 | | 625 | | 74.0 | | | | | | | | | | O2 0% 7.25% |
| 1405 | | | | 2.7 | 12.2 | | 631 | | 71.4 | | | | | | | | | 548 | CO2 -.1% 17.05% |
| 1420 | | | | 2.8 | 12.0 | | 635 | | 72.7 | | | | | | | | | | SO2 -10ppm 490ppm |
| 1435 | | | | 2.7 | 11.7 | | 637 | | 66.5 | | | | | | | | | 543 | NOx 0ppm 87.6ppm |
| 1450 | | | | 2.7 | 11.9 | | 668 | | 62.8 | | | | | | | | | | |
| 1505 | | | | 2.7 | 12.2 | | 629 | | 73.4 | | | | | | | | | 553 | |
| 1520 | | | | Test over | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | AVERAGE |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

032 1/82

## 4.2 FIELD DATA SHEETS FOR EPA METHOD 5/8, SASS, VOST, ANDERSEN IMPACTOR, CONTROLLED CONDENSATION (CCS), AND EPA METHOD 7

# FIELD DATA

Page 1 of 2

Plant Chevron
Date 2-1-84
Sample Location SVS-69 Outlet
Sample Type M5/8
Run Number 1
Operator Bost
Ambient Temperature
Barometric Pressure 29.28
Static Pressure, ($H_2O$)
Filter Number(s) 84-953-010

| Impinger Volumes Initial | Final | Net Gain |
|---|---|---|
| 477.5 | 534.0 | |
| 554.3 | 604.7 | |
| 528.6 | | |
| | | |
| | | |
| | | |
| Silica Gel 691.6 | 730.0 | |
| | | |

SASS Condensate
Total Volume

Probe Length and Type 5' glass
Nozzle Size & I.D. .309 P-100 Clamex
Pitot Coefficient & I.D.
Assumed Moisture 11
Molecular Weight, Dry, ($M_d$)
Meter Box Number D555
Meter Coefficient .699
α Factor 0.975
K = 935.06
$K(Nd)^4 = \_\_\_ \times (\_\_\_)^4 = \_\_\_$
$\Delta H = K(N_d)^4 \left(\frac{Tm}{Ts}\right)$ ( P)

Leak Check: Initial at 15 " Hg, .013 CFM from filter
Final at 15 " Hg, .009 CFM from filter
Pitot Leak Check: O.K.

| Traverse Point Number | Sampling Time, min | Clock Time (24-hr) Clock | Gas Meter Reading ($V_m$), ft 3 | Velocity Head ($\Delta P_s$), in. $H_2O$ | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ Desired | Actual | Temperature °F Stack | Probe | Impinger | Organic Module | Oven | Gas Meter In | Out | Pump Vacuum in. Hg | Avg. $\sqrt{\Delta P}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1124 | Init. 720.987 | | | | | | | | | | | | |
| 12 | 0.0 | | 720.987 | .37 | 1.81 | 1.8 | 457 | 227 | 37 | | 264 | 65 | 65 | 7 | |
| 11 | 3.0 | | 723.21 | .45 | 2.18 | 2.2 | 466 | 232 | 36 | | 244 | 66 | 68 | 10 | |
| 10 | 6.0 | | 725.55 | .49 | 2.27 | 2.3 | 465 | 237 | 36 | | 256 | 69 | 67 | 10 | |
| 9 | 9.0 | | 727.98 | .45 | 2.18 | 2.2 | 464 | 226 | 38 | | 255 | 69 | 67 | 10 | |
| 8 | 12.0 | | 730.44 | .45 | 2.21 | 2.2 | 455 | 227 | 38 | | 256 | 69 | 67 | 10 | |
| 7 | 15.0 | | 732.83 | .45 | 2.21 | 2.2 | 456 | 229 | 42 | | 256 | 69 | 66 | 10 | |
| 6 | 18.0 | | 735.24 | .45 | 2.21 | 2.2 | 454 | 230 | 45 | | 255 | 68 | 65 | 11 | |
| 5 | 21.0 | | 738.44 | .40 | 1.97 | 2.0 | 455 | 232 | 46 | | 258 | 67 | 65 | 11 | |
| 4 | 24.0 | | 739.96 | .35 | 1.72 | 1.7 | 456 | 234 | 46 | | 257 | 68 | 65 | 11 | |

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Comments:

| Traverse Point Number | Sampling Time, min | Clock Time (24-hr) Clock | Gas Meter Reading ($V_m$), ft 3 | Velocity Head ($\Delta P_s$), in. $H_2O$ | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ |  | Temperature °F |  |  |  |  |  |  | Pump Vacuum in. Hg | Avg. $\sqrt{\Delta P}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Init. |  | Desired | Actual | Stack | Probe | Impinger | Organic Module | Oven | Gas Meter In | Gas Meter Out |  |  |
| 3 | 27.0 |  | 742.13 | .35 | 1.72 | 1.7 | 456 | 232 | 45 |  | 256 | 68 | 65 | 10 |  |
| 2 | 30.0 |  | 744.25 | .35 | 1.72 | 1.7 | 454 | 233 | 46 |  | 255 | 68 | 65 | 10 |  |
| 1 | 33.0 |  | 746.39 | .25 | 1.23 | 1.2 | 450 | 231 | 48 |  | 254 | 67 | 65 | 8 |  |
|  | 36.0 End |  | 748.276 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | 36.0 | 1216 | 748.276 | .50 | 2.46 | 2.4 | 453 | 227 | 52 |  | 266 | 68 | 67 | 15 |  |
| 11 | 39.0 |  | 750.77 | .50 | 2.46 | 2.4 | 454 | 232 | 47 |  | 261 | 72 | 69 | 15 |  |
| 10 | 42.0 |  | 753.45 | .50 | 2.49 | 2.5 | 454 | 231 | 48 |  | 259 | 74 | 71 | 11 |  |
| 9 | 45.0 |  | 756.15 | .48 | 2.39 | 2.4 | 453 | 235 | 52 |  | 261 | 75 | 71 | 11 |  |
| 8 | 48.0 |  | 758.66 | .47 | 2.34 | 2.3 | 453 | 238 | 52 |  | 268 | 76 | 72 | 11 |  |
| 7 | 51.0 |  | 761.12 | .45 | 2.24 | 2.2 | 454 | 238 | 55 |  | 269 | 74 | 72 | 10 |  |
| 6 | 54.0 |  | 763.54 | .45 | 2.25 | 2.2 | 453 | 242 | 54 |  | 270 | 76 | 73 | 10 |  |
| 5 | 57.0 |  | 765.93 | .43 | 2.10 | 2.10 | 453 | 239 | 55 |  | 271 | 75 | 72 | 10 |  |
| 4 | 60.0 |  | 768.34 | .45 | 2.25 | 2.2 | 454 | 237 | 54 |  | 272 | 76 | 73 | 10 |  |
| 3 | 63.0 |  | 770.71 | .45 | 2.25 | 2.2 | 452 | 235 | 54 |  | 268 | 76 | 73 | 10 |  |
| 2 | 66.0 |  | 773.11 | .45 | 2.25 | 2.2 | 450 | 237 | 54 |  | 266 | 76 | 72 | 11 |  |
| 1 | 69.0 |  | 775.64 | .25 | 1.25 | 1.3 | 450 | 238 | 54 |  | 264 | 76 | 72 | 8 |  |
|  | 72.0 End |  | 777.625 | .649 |  | 2.075 | 456.2 |  |  |  |  |  | 69.9 |  |  |

Purge train for 15 minutes at 1:04

Run No. 1 56.638 Date 2-1-84 Sampling Location Outlet

($\sqrt{\Delta p}$)

Comments:

M5/8

FIELD DATA

Page 1 of 2

Plant Chevron
Date 2-1-84
Sample Location SVS-69 Outlet
Sample Type 5/8
Run Number 2
Operator Best
Ambient Temperature
Barometric Pressure
Static Pressure, ($H_2O$) + 0.2
Filter Number(s)

Leak Check: Initial at 15 " Hg, .011 CFM from filter
Final at 10 " Hg, .008 CFM from filter
Pitot Leak Check: O.K.

Impinger Volumes

| Initial | Final | Net Gain |
|---|---|---|
| 500.0 | 534.3 | 34.3 |
| 558.1 | 601.2 | 43.1 |
| 530.0 | 559.0 | 29.0 |

Silica Gel

| Initial | Final | Net Gain |
|---|---|---|
| 560.9 | 584.0 totally spent | 23.1 |

SASS Condensate N/A
Total Volume 129.5

Probe Length and Type 5' glass
Nozzle Size & I.D. .309 P-100 dower
Pitot Coefficient & I.D.
Assumed Moisture 11
Molecular Weight, Dry, ($M_d$)
Meter Box Number D555
Meter Coefficient .699
α Factor .995
K =
$K(Nd)^4$ = ___ x ( ___ $)^4$ = ___
$\Delta H = K(N_d)^4 \left(\frac{Tm}{Ts}\right)$ ( P)

| Traverse Point Number West | Sampling Time, min / Clock Time (24-hr) Clock | Gas Meter Reading ($V_m$), ft $^3$ | Velocity Head ($\Delta P_s$), in. $H_2O$ | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ Desired | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ Actual | Temperature °F Stack | Temperature °F Probe | Temperature °F Impinger | Temperature °F Organic Module | Temperature °F Oven | Temperature °F Gas Meter In | Temperature °F Gas Meter Out | Pump Vacuum in. Hg | Avg. $\sqrt{\Delta P}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 1940 | Init. 787.417 |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | 0.0 | 787.417 | .43 | 2.07 | 2.1 | 472 | 252 | 58 |  | 243 | 67 | 66 | 7 |  |
| 11 | 3.0 | 789.78 | .43 | 2.07 | 2.1 | 472 | 248 | 48 |  | 256 | 68 | 66 | 7 |  |
| 10 | 6.0 | 792.31 | .50 | 2.40 | 2.4 | 472 | 231 | 58 |  | 272 | 72 | 71 | 8 |  |
| 9 | 9.0 | 794.43 | .48 | 2.31 | 2.3 | 473 | 235 | 52 |  | 271 | 73 | 69 | 9 |  |
| 8 | 12.0 | 796.86 | .50 | 2.44 | 2.4 | 473 | 242 | 56 |  | 279 | 74 | 72 | 9 |  |
| 7 | 15.0 | 799.46 | .45 | 2.19 | 2.2 | 472 | 244 | 62 |  | 245 | 76 | 72 | 8 |  |
| 6 | 18.0 | 801.90 | .43 | 2.11 | 2.1 | 473 | 235 | 67 |  | 235 | 78 | 74 | 8 |  |
| 5 | 21.0 | 804.33 | .45 | 2.20 | 2.2 | 475 | 238 | 65 |  | 224 | 79 | 75 | 8 |  |
| 4 | 24.0 | 806.79 | .45 | 2.21 | 2.2 | 474 | 234 | 60 |  | 235 | 80 | 77 | 8 |  |

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Comments:

Page 2 of 2

| Traverse Point Number | Sampling Time, min / Clock Time (24-hr) Clock | Gas Meter Reading ($V_m$), ft 3 Init. | Velocity Head ($\Delta P_s$), in. $H_2O$ | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ Desired | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ Actual | Temperature °F Stack | Temperature °F Probe | Temperature °F Impinger | Temperature °F Organic Module | Temperature °F Oven | Temperature °F Gas Meter In | Temperature °F Gas Meter Out | Pump Vacuum in. Hg | Avg. $\sqrt{\Delta P}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 27.0 | 809.17 | .45 | 2.21 | 2.2 | 476 | 242 | 56 | | 258 | 81 | 77 | 8 | |
| 2 | 30.0 | 811.60 | .45 | 2.22 | 2.2 | 475 | 242 | 56 | | 265 | 81 | 78 | 8 | |
| 1 | 33.0 | 814.04 | .45 | 2.22 | 2.2 | 474 | 248 | 48 | | 273 | 81 | 78 | 8 | |
| | 36.0 Stop | 816.496 | | | | | | | | | | | | |
| 12 | South 36.0 2100 | 816.496 | .47 | 2.29 | 2.3 | 488 | 298 | 49 | | 280 | 80 | 82 | 8 | |
| 11 | 39.0 | 818.96 | .45 | 2.19 | 2.2 | 487 | 263 | 51 | | 243 | 84 | 83 | 8 | |
| 10 | 42.0 | 821.34 | .50 | 2.44 | 2.4 | 490 | 258 | 55 | | 238 | 85 | 83 | 8 | |
| 9 | 45.0 | 823.80 | .50 | 2.45 | 2.4 | 485 | 253 | 55 | | 233 | 84 | 82 | 9 | |
| 8 | 48.0 | 826.34 | .50 | 2.45 | 2.4 | 486 | 248 | 54 | | 271 | 84 | 81 | 9 | |
| 7 | 51.0 | 828.87 | .50 | 2.44 | 2.4 | 485 | 243 | 53 | | 267 | 83 | 81 | 9 | |
| 6 | 54.0 | 831.39 | .45 | 2.20 | 2.2 | 483 | 231 | 53 | | 267 | 83 | 81 | 9 | |
| 5 | 57.0 | 833.85 | .42 | 2.05 | 2.1 | 483 | 235 | 52 | | 269 | 82 | 80 | 9 | |
| 4 | 60.0 | 836.26 | .43 | 2.05 | 2.1 | 482 | 241 | 51 | | 269 | 80 | 78 | 9 | |
| 3 | 63.0 | 838.63 | .40 | 1.95 | 1.9 | 483 | 238 | 50 | | 262 | 80 | 78 | 8 | |
| 2 | 66.0 | 840.96 | .40 | 1.95 | 1.9 | 483 | 240 | 50 | | 263 | 80 | 78 | 8 | |
| 1 | 69.0 | 843.36 | .30 | 1.46 | 1.5 | 482 | 241 | 49 | | 267 | 79 | 77 | 7 | |
| | 72.0 End | 845.360 | | | | | | | | | | | | |
| | | 57.943 | .6696 ($\sqrt{\Delta P}$) | | 2.18 | 479.1 | | | | | 77.8 | | ÷48 | |

Run No. 2

Date 2-1-84

Sampling Location Outlet

Comments: Purge for 15 minutes at 1.0 ΔH

# FIELD DATA

Page 1 of 2

Plant Chevron
Date 2/1/84
Sample Location
Sample Type SASS
Run Number 1
Operator Kaufmann
Ambient Temperature ~65
Barometric Pressure 29.26
Static Pressure, ($H_2O$) +0.5
Filter Number(s) 31, 32, 33, 34,

Leak Check: Initial at 19 " Hg, .016 CFM
Final at 20 " Hg, ____ CFM
Pitot Leak Check: O.K.

| Impinger Volumes Initial | Final | Net Gain |
|---|---|---|
| 500 | 547 | |
| 500 | 840 | |
| 500 | | |
| | | |
| | | |
| | | |
| | Silica Gel | |
| 1089.8 | 1322.6 | |
| 973.7 | | |

SASS Condensate 1920
Total Volume

Probe Length and Type 3 ft.
Nozzle Size & I.D. 0.674 P-205
Pitot Coefficient & I.D. 0.816 P-02
Assumed Moisture 11%
Molecular Weight, Dry, ($M_d$)
Meter Box Number 105
Meter Coefficient 1.039
α Factor 3.356
K = 38.419
$K(Nd)^4$ = ____ x (____)$^4$ = 7.93
$\Delta H = K(N_d)^4 \left(\frac{Tm}{Ts}\right)$ ( P)

| Traverse Point Number | Sampling Time, min | Clock Time (24-hr) Clock | Gas Meter Reading ($V_m$), ft 3 | Velocity Head ($\Delta P_s$), in. $H_2O$ | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ | | Temperature °F | | | | | Gas Meter | | Pump Vacuum in. Hg | Avg. $\sqrt{\Delta P}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Desired | Actual | Stack | Probe | Impinger | Organic Module | Oven | In | Out | | |
| | 0 | 1129 | Init. 73.411 | | | | | | | | | | | | |
| | 10 | | 111.5 | .45 | 2.10 | 2.1 | 454 | 319 | | 48 | 395 | 78 | 78 | 18 | .671 |
| | 20 | | 148.1 | .40 | 1.87 | 1.9 | 450 | 396 | | 50 | 402 | 78 | 77 | 17 | .632 |
| | 30 | | 183.9 | .40 | 1.88 | 1.9 | 451 | 407 | | 49 | 405 | 84 | 78 | 17 | .632 |
| | 40 | | 219.3 | .40 | 1.90 | 1.9 | 450 | 411 | | 50 | 407 | 87 | 81 | 19 | .632 |
| | 50 | | 254.4 | .40 | 1.91 | 1.7 | 451 | 409 | | 52 | 408 | 92 | 84 | 20 | .632 |
| | 60 | 1233 | 290.9 | .40 | 1.91 | 1.9 | 451 | 409 | | 54 | 325 | 90 | 89 | 12. | .632 |
| | 70 | | 326.3 | .40 | 1.92 | 1.9 | 450 | 409 | | 51 | 342 | 92 | 89 | 16 | .632 |
| | 80 | | 362.4 | .40 | 1.93 | 1.9 | 450 | 409 | | 51 | 364 | 97 | 91 | 17 | .632 |
| | 90 | | 400.6 | .40 | 1.93 | 1.9 | 454 | 409 | | 51 | 375 | 99 | 94 | 18 | .632 |

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min. 31 - drain condensate from Org. Mod. min 61 - Drain condensate
Comments: min 50 - stop to change filters restart 1233

Page 2 of 2

| Traverse Point Number | Sampling Time, min | Clock Time (24-hr) Clock | Gas Meter Reading ($V_m$), ft 3 | Velocity Head ($\Delta P_s$), in. $H_2O$ | Orifice Pressure Differential ($\Delta H$), in. $H_2O$ | | Temperature °F | | | | | Gas Meter | | Pump Vacuum in. Hg | Avg. $\sqrt{\Delta P}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Desired | Actual | Stack | Probe | Impinger | Organic Module | Oven | In | Out | | |
| | 90 | | Init. 400.6 | | | | | | | | | | | | |
| | 100 | | 435.2 | .40 | 1.94 | 1.9 | 457 | 409 | | 51 | 383 | 104 | 96 | 20 | .632 |
| | 110 | | 470.7 | .40 | 1.94 | 1.7 | 454 | 408 | | 50 | 377 | 98 | 98 | 20 | .632 |
| | 120 | 1400 | 506.0 | .40 | 1.94 | 1.7 | 450 | 409 | | 52 | 370 | 99 | 97 | 20 | .632 |
| | 130 | | 542.0 | .40 | 1.94 | 1.9 | 449 | 404 | | 75 | 385 | 95 | 95 | 14 | .632 |
| | 140 | 1442 | 580.7 | .40 | 1.94 | 1.9 | 448 | 404 | | 72 | 406 | 95 | 94 | 15 | .632 |
| | 150 | | 616.0 | .40 | 1.94 | 1.9 | 449 | 412 | | 54 | 409 | 97 | 95 | 17 | .632 |
| | 160 | | 651.8 | .40 | 1.95 | 1.9 | 448 | 413 | | 54 | 407 | 101 | 96 | 18 | .632 |
| | 170 | | 687.1 | .40 | 1.92 | 1.8 | 467 | 406 | | 51 | 410 | 103 | 97 | 20 | .632 |
| | 180 | 1521 | 721.6 | .40 | 1.91 | 1.6 | 470 | 406 | | 52 | 409 | 104 | 98 | 20 | .632 |
| | 190 | | 758.1 | .40 | 1.90 | 1.9 | 466 | 406 | | 57 | 362 | 94 | 98 | 14 | .632 |
| | 200 | | 795.1 | .40 | 1.91 | 1.9 | 466 | 412 | | 53 | 343 | 96 | 97 | 16 | .632 |
| | 210 | | 832.7 | .40 | 1.91 | 1.9 | 466 | 414 | | 54 | 333 | 101 | 97 | 19 | .632 |
| | 220 | | 868.6 | .40 | 1.93 | 1.9 | 463 | 415 | | 56 | 369 | 103 | 99 | 20 | .632 |
| | 230 | | 904.6 | .40 | 1.93 | 1.8 | 463 | 414 | | 56 | 377 | 104 | 99 | 20 | .632 |
| | 240 | | 939.830 | .40 | 1.93 | 1.7 | 463 | 406 | | 56 | 369 | 103 | 99 | | .632 |
| | | | | | | | | | | | | | | | |
| | | | 866.42 | 0.42 | 1.93 | 1.9 | 456 | | | | | | | | 0.632 |

Run No. SASS 1

Date 2/1/84

Sampling Location Boiler outlet

Comments:

Min [illegible] - Stop to change filter Restart 1400
Min 121 - Drain condinsate
Min 140 - Stop to change S.G. Restart 1422
Min 152 - Drain Condinsate
Min 180 - Stop to change filter Restart 1521
Min 185 - Drain Condinsate
Min 240 - Stop ~~to change filter~~ ~~Restart~~

Stop test - filter holder connection galled, cannot remove filter holder

### Volatile Organic Sampling Sampling Train (VOST) Data Sheet

Plant Chevron (EER) / CMEA

Date 2-1-84

Sample Location Sec. 27 Unit 39 STACK

Run No. 1 (TRAPS packed in culture tubes)

Project No. 307735.81

Operator M. M. Murray

Barometric Pressure (in. Hg) 29.28 (2pm)

Ambient Temperature (°F) 60

| Trap Set | Trap I.D. | Clock Time 24 Hour | Elapsed Time (minutes) | Dry Gas Meter (L) | Volume Sampled (L) | Temperature (°F) | | | | Rotometer Setting | Pump Vacuum (in. Hg) | Leak Rate LPM at Vacuum | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DGM | Probe | Heated Line | Tenax Inlet | | | | |
| A | 45 | Start: 1530 | 42 | 0.00 | 21.188 | 70 | 370 | N/A | 57 | 40 | <1 | 0.05@ | 68°F before 2nd trap |
| | 19A | Stop: 1612 | | 21.188 | | 78 | 354 | N/A | 62 | 40 | <1 | 15"Hg | 84°F before 2nd trap |
| B | 23 | Start: 1714 | 40.5 | 0.00 | 20.140 | 64 | 331 | N/A | 52 | 40 | <1 | 0.07Lpm@ | 61°F before 2nd trap |
| | 24A | Stop: 80 | | 20.14 | | 68 | 316 | N/A | 64 | 38 | <1 | 15"Hg | 68°F " " " |
| C | 9 | Start: 1730 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Trip Blank |
| | 35A | Stop: — | | N/A | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| D | 11 | Start: N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Field Blank |
| | 32A | Stop: N/A | | N/A | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| E | 21 | Start: 1825 | 41.1 | 0.00 | 20.151 | 62 | 365 | N/A | 52 | 40 | 0.5 | 0.04@ | 75°F before 2nd TRAP |
| | 13A | Stop: 1906 | | 20.151 | | 70 | 345 | N/A | 57 | 37 | 5 | 10"Hg | 69°F before 2nd trap |
| F | | Start: | | | | | | | | | | | |
| | | Stop: | | | | | | | | | | | |
| Summary | | | | | | | | | | | | | |

Notes: a/ 2nd knockout impinger added after test set A (wouldn't seal properly for set A & was wrapped c̄ TFE tape for test B)

b/ After set A, noticed charcoal fines in 1st condenser (probably from charcoal purge trap). Condenser was changed out c̄ clean one.

c/ culture tube broke & lost ¼" cap for TRAP #45; ¼" cap lost from 19A d/ sudden increase in stack moisture during set B

e/ SET E - 1st trap has significant moisture - not noted with other sets (After 15 mins of test)

## Volatile Organic Sampling Sampling Train (VOST) Data Sheet

Plant Chevron/EER (AMEA)
Date 2/1/84
Sample Location Sec 27 Unit 39 STACK
Run No. 2 (traps in cigar boxes)

Project No. 307135.80
Operator Murray
Barometric Pressure (in. Hg) 29.28
Ambient Temperature (°F) 60

| Trap Set | Trap I.D. | Clock Time 24 Hour | Elapsed Time (minutes) | Dry Gas Meter (L) | Volume Sampled (L) | Temperature (°F) | | | | Rotometer Setting | Pump Vacuum (in. Hg) | Leak Rate LPM at Vacuum | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DGM | Probe | Heated Line | Tenax Inlet | | | | |
| A | 42 | Start: 1901 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | TRIP BLANK<br>N |
| | 15A | Stop: N/A | | N/A | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| B | 70 | Start: 1945 | 39.7 | 0.00 | 20.01 | 62 | 316 | N/A | 67 | 40 | <1 | 0.06 @ 11" | 61° before 2nd trap |
| | 33A | Stop: 2025 | | 20.01 | | 70 | 316 | N/A | 60 | 40 | 1 | Hg | 66°F before 2nd trap |
| C | 40 | Start: 1940 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | FIELD BLANK |
| | 1A | Stop: N/A | | N/A | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| D | | Start: | | | | | | | | | | | |
| | | Stop: | | | | | | | | | | | |
| E | | Start: | | | | | | | | | | | |
| | | Stop: | | | | | | | | | | | |
| F | | Start: | | | | | | | | | | | |
| | | Stop: | | | | | | | | | | | |
| Summary | ☒ | ☒ | | ☒ | | | | | | | | ☒ | ☒ |

Notes:

ACUREX Corporation

# ANDERSEN FIELD TEST DATA

Plant Chevron (EER)
Test Location SVS-69 Out
Run No. 1
Molecular Weight
% $H_2O$

Date 2-22-84
Operator Best
Nozzle Size & No. .250
Pitot Coefficient .82
Pitot No.

Ambient Temperature °F
Barometric Pressure 27.36 " Hg
Static Pressure ($P_S$) -0.25 "$H_2O$ ~~" Hg~~
Filter Set No. UOP-23
Meter Box No. # 105
Orifice Coefficient .67 α 1.001

(.49cmf)

| SAMPLE POINT NUMBER | CLOCK TIME / SAMPLE TIME | VELOCITY HEAT ΔP in. wg. | ORIFICE METER ΔH in. wg. | GAS METER VOLUME FT³ | TEMPERATURES °F STACK | PROBE | IMPINGER | GAS METER IN | GAS METER OUT | PUMP VACUUM in. Hg | √ΔP | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 1104 0.0 | .44 | 0.9 | 945.646 | 549 | | | 67 | 67 | 5 | .663 | initial leakrate |
| | 5.0 | | 0.9 | 948.23 | | | | 65 | 66 | 5 | | .008 cfm at 10" Hg |
| | 10.0 | | 0.9 | 950.70 | | | | 65 | 67 | 5.5 | | preheat impactor |
| | 15.0 | | 0.9 | | | | | 64 | 65 | 6 | | 20min in stack |
| | 20.0 | | 0.9 | 955.58 | | | | 64 | 64 | 6.5 | | |
| | 25.0 | | 0.9 | 957.08 | 556 | | | 64 | 64 | 7 | | |
| | ~~30.0~~ End | | | 960.628 | | | | | | | | |
| | 30.15 | | | | | | | | | | | Final leak rate |
| | | | | | | | | | | | | 0.009 at 10" Hg |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
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| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| AVERAGE / TOTAL | 30.15 | | 0.9 | 14.982 | 552.5 | | | 64.8 | 65.5 | | | |

(65.2)

902229

902227

Form FED-070 B 6-79

ACUREX
Corporation

# ANDERSEN FIELD TEST DATA

Plant Chevron (CEER)
Test Location SVS-69 Outlet
Run No. 2
Molecular Weight
% $H_2O$

Date 2-22-84
Operator Best
Nozzle Size & No. .250
Pitot Coefficient .82
Pitot No.

Ambient Temperature °F
Barometric Pressure 29.32 " Hg
Static Pressure ($P_S$) -0.25 " $H_2O$ ~~" Hg~~
Filter Set No. UOP-20
Meter Box No. 105
Orifice Coefficient .67

| SAMPLE POINT NUMBER | CLOCK TIME | SAMPLE TIME | VELOCITY HEAD ΔP in. wg. | ORIFICE METER ΔH in. wg. | GAS METER VOLUME FT³ | TEMPERATURES °F STACK | PROBE | IMPINGER | GAS METER IN | GAS METER OUT | PUMP VACUUM in. Hg | √ΔP | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 1352 | 0.0 | .44 | 0.9 | 960.875 | 532 | | | 61 | 59 | 5 | .663 | initial leak rate |
| | | 6.0 | | 0.9 | 963.36 | | | | 60 | 59 | 6 | | .005 cfm at 10" Hg |
| | | 10.0 | | 0.9 | 965.79 | | | | 61 | 59 | 6 | | Preheat impactor |
| | | 15.0 | | 0.9 | 968.22 | | | | 60 | 59 | 6.5 | | 20 min. in stack |
| | | 20.0 | | 0.9 | 970.67 | | | | 61 | 58 | 7 | | |
| | | 25.0 | | 0.9 | 973.11 | | | | 63 | 58 | 7 | | |
| | | 30.0 | End | | 975.551 | 531 | | | | | | | |
| | | | | | | | | | | | | | Final leak rate |
| | | | | | | | | | | | | | .007 cfm at 10" Hg |
| AVERAGE / TOTAL | | 30.0 | | 0.9 | 14.676 | 531.5 | | | 60.8 | 58.7<br>59.8 | | .663 | |

900592

902230

902294

902226

Form FED-070 B 6.79

# CONTROLLED CONDENSATION SYSTEM (CCS)
## FIELD DATA SHEET

Plant Chevron EFR
Date 2-23-84
Sample Location SVS-69 Outlet
Run No. 1
Operator Best

Ambient Temperature
Barometric Pressure 29.34
Meter Box Number 105
Meter Orifice Coefficient .67
Meter α Factor 1.000

initial leakrate .003 cfm at 10" Hg (nozzle)

| Sampling Time, min / Clock Time (24-hr) clock | Gas Meter Reading ($V_m$), ft³ | Temperature (°F) | | | | | | | | ΔH | Hg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Stack | ④ Probe | Filter ③ Skin | Filter ⑤ Out | ② Recirc Water | ① Exit Coil | Dry Gas Meter In | Dry Gas Meter Out | | |
| | Init. 975,729 | | | | | | | | | | |
| 0.0 1243 | 975.729 | 537 | 575 | 1053 | 565 | 144 | 143 | 71 | 69 | 0.4 | 6 |
| 5.0 | | | 564 | 1140 | 700 | 148 | 147 | 69 | 67 | 0.4 | 6 |
| 10.0 | 779.18 | | 559 | 796 | 581 | 150 | 148 | 68 | 67 | 0.4 | 6 |
| 15.0 | 980.88 | | 579 | 867 | 514 | 149 | 147 | 69 | 67 | 0.4 | 6.5 |
| 20.0 | ~~984.40~~ | | 586 | 1226 | 706 | 149 | 147 | 67 | 67 | 0.4 | 7 |
| 25.0 | 984.40 | | 595 | 1296 | 783 | 149 | 147 | 67 | 66 | 0.4 | 7 |
| 30.0 | 986.12 | | 591 | 865 | 583 | 149 | 147 | 67 | 67 | 0.4 | 7 |
| 35.0 | 987.90 | | 592 | 863 | 516 | 149 | 147 | 67 | 65 | 0.4 | 7 |
| 40.0 | 789.51 | | 597 | 1200 | 685 | 149 | 147 | 67 | 65 | 0.4 | 8 |
| 45.0 | 991.27 | | 586 | 787 | 534 | 150 | 148 | 67 | 66 | 0.4 | 8 |
| 50.0 | 993.1 | | 587 | 736 | 501 | 149 | 147 | 66 | 66 | 0.4 | 9 |
| 55.0 | 994.71 | | 589 | 1151 | 694 | 149 | 147 | 66 | 66 | 0.4 | 9 |
| 60.0 End | 996.494 | | | | | | | 67.8 | 66.5 | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Average | 20.715 | | | | | | | 67.2 | | | |

Final leakrate (nozzle) .007 at 10" Hg

## CONTROLLED CONDENSATION SYSTEM (CCS)
## FIELD DATA SHEET

Plant Chevron CEER)
Date 2-23-84
Sample Location SVS-69 Outlet
Run No. 2
Operator Best

Ambient Temperature
Barometric Pressure 29.32
Meter Box Number 105
Meter Orifice Coefficient .67
Meter α Factor 1.000

initial leak rate .005 at 10" Hg (nozzle)

| Clock Time (24-hr) clock / Sampling Time, min | Gas Meter Reading ($V_m$), ft³ | Temperature (°F) | | | | | | | | ΔH | Pump Hg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Stack | ④ Probe | Filter | | ① Recirc Water | ② Exit Coil | Dry Gas Meter | | | |
| | Init. 996.577 | | | ③ Skin | ⑤ Out | | | In | Out | | |
| 1737<br>0.0 | 996.577 | 449 | 527 | 1232 | 475 | 153 | 145 | 64 | 64 | 0.4 | 8 |
| 5.0 | 998.42 | | 576 | 1271 | 532 | 159 | 143 | 63 | 65 | 0.4 | 7 |
| 10.0 | ~~018.90~~ | | 577 | 1224 | 577 | 153 | 145 | 64 | 65 | 0.4 | 7 |
| 15.0 | 018.90 | | 577 | 1220 | 562 | 153 | 145 | 64 | 64 | 0.4 | 7 |
| 20.0 | 003.43 | | 582 | 1212 | 553 | 154 | 146 | 64 | 64 | 0.4 | 8 |
| 25.0 | 005.36 | | 576 | 1183 | 530 | 154 | 146 | 62 | 62 | 0.4 | 8 |
| 30.0 | 007.10 | | 585 | 1320 | 535 | 154 | 146 | 62 | 62 | 0.4 | 9 |
| 35.0 | ~~010.67~~ | | 580 | 1331 | 523 | 154 | 146 | 62 | 62 | 0.4 | 9.5 |
| 40.0 | 010.67 | | 580 | 1252 | 511 | 154 | 146 | ~~62~~ 60 | ~~58~~ 59 | 0.4 | 10 |
| 45.0 | 012.44 | | 582 | 1231 | 544 | 153 | 145 | 58 | 59 | 0.4 | 10 |
| 50.0 | 014.16 | | 577 | 1298 | 497 | 153 | 145 | 58 | 59 | 0.4 | 10 |
| 55.0 | 015.85 | | 579 | 1222 | 486 | 153 | 145 | 57 | 58 | 0.4 | 10 |
| 60.0 End | 017.501 | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Average | 20.924 | | | | | | | 61.5<br>(61.7) | 61.9 | 0.4 | |

Final leak rate .005 at 10" Hg

ACUREX CORPORATION PROJECT # 307735.81

Run Number 1
Date 1-24-84

## NO$_x$ SAMPLING

### PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| N/A | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☐ N/A |

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 2 | 25 | 18 | |
| Volume of Flask Less Absorb. Soln. | 2032 | 2087 | 2079 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.65 | 29.65 | 29.65 | |
| Flask Temperature (°F) | 70 | 70 | 72 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 13.2 | 16.2 | 15.9 | |
| Bottom | 16.2 | 13.1 | 13.2 | |
| Difference | 29.4 | 29.3 | 29.1 | |
| Leak Check | OK | OK | OK | |
| Sampling Location: | | | | |
| Port | Directly above cm port | | — | |
| Point or Distance from Inside of Port | ~1.5' | 1.5' | 1.5' | |
| Clock Time | 1101 | 1116 | 1132 | |
| Performed by | mmm | mmm | mmm | |

Comments:
Probe Temp = 406°F

307735.81

Run Number 1

# $NO_x$ SAMPLE RECOVERY AND ANALYSIS

## SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 2 | 25 | 18 | |
| Final Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.50 | 29.50 | 29.50 | |
| Flask Temperature (°F) | 64 | 71 | 72 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 0.2 | 0.2 | 0.5 | |
| Bottom | 0.8 | 0.2 | 0.7 | |
| Difference | 1.0 | 0.4 | 1.2 | |
| Sample Number | 901398 | 901399 | 901400 | |
| Date | 1-25-84 | 1-25-84 | 1-25-84 | |
| Clock Time | 1048 | 1455 | 1128 | |
| Performed by | mmm | mmm | mmm | |

## ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901398 | 901399 | 901400 | |
| Absorbance of Sample | 0.170 | 0.209 | 0.161 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of $NO_x$ as $NO_2$ ($\mu g$) | 250.0 | 307.3 | 236.7 | |
| Analysis Date | 3-15-84 | 3-15-84 | 3-15-84 | |
| Analyzed by | mmm | mmm | mmm | |

Comments:

ACUREX CORPORATION

307735.81

Run Number 2
Date 1-24-84

## $NO_x$ SAMPLING

### PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☐ N/A |

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 7 | 8 | 6 | |
| Volume of Flask Less Absorb. Soln. | 2046 | 1995 | 2062 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.65 | 29.65 | 29.65 | |
| Flask Temperature (°F) | 68 | 70 | 80 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 16.2 | 13.2 | 16.2 | |
| Bottom | 13.2 | 16.2 | 13.2 | |
| Difference | 29.4 | 29.4 | 29.4 | |
| Leak Check | OK | OK | OK | |
| Sampling Location: | | | | |
| Port | directly above cm port | | | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1201 | 1216 | 1232 | |
| Performed by | mmm | mmm | mmm | |

Comments:

Probe temp = 406°F

Run Number 2

## $NO_x$ SAMPLE RECOVERY AND ANALYSIS

### SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 7 | 8 | 6 | |
| Final Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.44 | 29.44 | 29.44 | |
| Flask Temperature (°F) | 72 | 74 | 74 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 0.2 | 0.3 | 0.3 | |
| Bottom | 0.2 | 0.3 | 0.5 | |
| Difference | 0.4 | 0.6 | 0.8 | |
| Sample Number | 901401 | 901402 | 901403 | |
| Date | 1-2584 | 1-25-84 | 1-25-84 | |
| Clock Time | 1500 | 1430 | 1452 | |
| Performed by | mmm | mmm | mmm | |

### ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901401 | 901402 | 901403 | |
| Absorbance of Sample | 0.211 | 0.359 | 0.275 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of $NO_x$ as $NO_2$ (µg) | 620.5 | 1055.7 | 808.7 | |
| Analysis Date | 3-15-84 | 3-15-84 | 3-15-84 | |
| Analyzed by | mmm | mmm | mmm | |

Comments:

307935.81

ACUREX CORPORATION

Run Number 3
Date 1-24-84

## NO$_x$ SAMPLING

### PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| N/A | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ ______ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☐ N/A |

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 5 | 4 | 13 | |
| Volume of Flask Less Absorb. Soln. | 1989 | 2023 | 2075 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.58 | 29.58 | 29.58 | |
| Flask Temperature (°F) | 80 | 75 | 78 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 15.9 | 16.1 | 13.1 | |
| Bottom | 13.2 | 13.1 | 16.0 | |
| Difference | 29.1 | 29.2 | 29.1 | |
| Leak Check | OK | OK | OK | |
| Sampling Location: | | | | |
| Port | directly above CM PORT | | | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1301 | 1316 | 1331 | |
| Performed by | mmm | mmm | mmm | |

Comments:

Probe temp = 390°F

307735.81

Run Number 3

## NO$_x$ SAMPLE RECOVERY AND ANALYSIS

### SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 5 | 4 | 13 | |
| **Final Conditions:** | | | | |
| Barometric Pressure (in. Hg) | 29.50 | 29.5 | 29.5 | |
| Flask Temperature (°F) | 62 | 73 | 64 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 0.6 | 0.1 | 0.2 | |
| Bottom | 0.3 | 0.1 | 0.3 | |
| Difference | 0.9 | 0.2 | 0.5 | |
| Sample Number | 901404 | 901405 | 901406 | |
| Date | 1-25-84 | 1-25-84 | 1-25-84 | |
| Clock Time | 1111 | 1446 | 1050 | |
| Performed by | mmm | mmm | mmm | |

### ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901404 | 901405 | 901406 | 901406 |
| Absorbance of Sample | 0.169 | 0.150 | 0.282 | 0.248 |
| Absorbance of Blank | 0 | 0 | 0 | 0 |
| Calibration Curve No. | 1 | 1 | 1 | 1 |
| Mass of NO$_x$ as NO$_2$ ($\mu$g) | 248.5 | 220.5 | 829.3 | 729.3 |
| Analysis Date | 3-15-84 | 3-15-84 | 3-15-84 | 3-15-84 |
| Analyzed by | mmm | mmm | mmm | mmm |

**Comments:**

Sample recovery - slight sample loss during recovery of #13 & #4

307735.81

ACUREX CORPORATION

Run Number 4
Date 1-24-84

# NO$_x$ SAMPLING

## PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| N/A | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☐ N/A |

## SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 46 | 9 | 14 | |
| Volume of Flask Less Absorb. Soln. | 2082 | 2077 | 2049 | |
| **Initial Conditions:** | | | | |
| Barometric Pressure (in. Hg) | 29.54 | 29.54 | 29.54 | |
| Flask Temperature (°F) | 74 | 75 | 76 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 16.2 | 16.1 | 16.1 | |
| Bottom | 13.2 | 13.2 | 13.0 | |
| Difference | 29.4 | 29.3 | 29.1 | |
| Leak Check | OK | OK | OK | |
| **Sampling Location:** | | | | |
| Port | directly above cm port | | | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1401 | 1416 | 1431 | |
| Performed by | mmm | mmm | mmm | |

Comments:
probe temp = 428°F

307735.81

Run Number 4

## NO$_x$ SAMPLE RECOVERY AND ANALYSIS

### SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 46 | 9 | 14 | |
| **Final Conditions:** | | | | |
| Barometric Pressure (in. Hg) | 29.50 | 29.5 | 29.5 | |
| Flask Temperature (°F) | 70 | 72 | 64 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 1.2 | 0.6 | 0.8 | |
| Bottom | 1.0 | 0.7 | 0.4 | |
| Difference | 2.2 | 1.3 | 1.2 | |
| Sample Number | 901407 | 901408 | 901409 | |
| Date | 1-25-84 | 1-25-84 | 1-25-84 | |
| Clock Time | 1155 | 1450 | 1109 | |
| Performed by | mmm | mmm | mmm | |

### ANALYSIS

Analysis Procedure spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901407 | 901408 | 901409 | |
| Absorbance of Sample | 0.188 | 0.109 | 0.138 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of NO$_x$ as NO$_2$ ($\mu$g) | 276.4 | 160.3 | 202.9 | |
| Analysis Date | 3-15-84 | 3-15-84 | 3-15-84 | |
| Analyzed by | mmm | mmm | mmm | |

Comments:

slight loss of sample in recovery of #46

307735.81

ACUREX CORPORATION

Run Number 5
Date 1-24-84

## NO$_x$ SAMPLING

### PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| N/A | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ ______ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☑ N/A |

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 45 | 10 | 30 | |
| Volume of Flask Less Absorb. Soln. | 2075 | 2060 | 2006 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.54 | 29.54 | 29.54 | |
| Flask Temperature (°F) | 76 | 72 | 72 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 16.0 | 15.9 | 16.1 | |
| Bottom | 13.1 | 13.0 | 13.1 | |
| Difference | 29.1 | 28.9 | 29.2 | |
| Leak Check | OK | OK | OK | |
| Sampling Location: | | | | |
| Port | directly above cm port | | | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1501 | 1516 | 1531 | |
| Performed by | mmm | mmm | mmm | |

Comments:

307735.81

Run Number 5

## NO$_x$ SAMPLE RECOVERY AND ANALYSIS

### SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 45 | 10 | 30 | |
| Final Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.5 | 29.5 | 29.5 | |
| Flask Temperature (°F) | 66 | 73 | 65 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 0.9 | 0.2 | 0.8 | |
| Bottom | 0.6 | 0.8 | 1.0 | |
| Difference | 1.5 | 1.0 | 1.8 | |
| Sample Number | 901410 | 901411 | 901412 | |
| Date | 1-25-84 | 1-25-84 | 1-25-84 | |
| Clock Time | 1213 | 1446 | 1156 | |
| Performed by | mmm | mmm | mmm | |

### ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901410 | 901411 | 901412 | |
| Absorbance of Sample | 0.112 | 0.200 | 0.082 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of NO$_x$ as NO$_2$ ($\mu$g) | 164.7 | 294.1 | 120.6 | |
| Analysis Date | 3-15-84 | 3-15-84 | 3-15-84 | |
| Analyzed by | mmm | mmm | mmm | |

Comments:

307735.81

ACUREX CORPORATION

Run Number 6
Date 1-24-84

## $NO_x$ SAMPLING

### PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| N/A | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ ______ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☐ N/A |

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 17 | F52 | 21 | |
| Volume of Flask Less Absorb. Soln. | 2012 | 2043 | 2081 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.54 | 29.54 | 29.54 | |
| Flask Temperature (°F) | 72 | 72 | 74 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 13.1 | 16.2 | 16.2 | |
| Bottom | 16.0 | 13.0 | 13.1 | |
| Difference | 29.1 | 29.2 | 29.3 | |
| Leak Check | OK | OK | OK | |
| Sampling Location: | | | | |
| Port | directly | above | cm port | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1601. | 1616 | 1631 | |
| Performed by | mmm | mmm | mmm | |

Comments:
probe temp = 484°F

307735.81

Run Number 6

## NO$_x$ SAMPLE RECOVERY AND ANALYSIS

### SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 17 | F52 | 21 | |
| **Final Conditions:** | | | | |
| Barometric Pressure (in. Hg) | 29.46 | 29.46 | 29.46 | |
| Flask Temperature (°F) | 72 | 72 | 74 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 0.2 | 0.3 | 0.3 | |
| Bottom | 0.1 | 0.1 | 0.2 | |
| Difference | 0.3 | 0.4 | 0.5 | |
| Sample Number | 901413 | 901414 | 901415 | |
| Date | 1-25-84 | 1-25-84 | 1-25-84 | |
| Clock Time | 1315 | 1310 | 1430 | |
| Performed by | mmm | mmm | mmm | |

### ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901413 | 901414 | 901415 | |
| Absorbance of Sample | 0.141 | 0.235 | 0.122 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of NO$_x$ as NO$_2$ (μg) | 207.3 | 345.5 | 179.4 | |
| Analysis Date | 3-15-84 | 3-15-84 | 3-15-84 | |
| Analyzed by | mmm | mmm | mmm | |

Comments:

307735.81

ACUREX CORPORATION

Run Number 7
Date 1-24-84

## NO$_x$ SAMPLING

### PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| N/A | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☐ N/A |

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 1 | 22 | 2A | |
| Volume of Flask Less Absorb. Soln. | 1996 | 2045 | 2011 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.54 | 29.54 | 29.54 | |
| Flask Temperature (°F) | 66 | 65 | 65 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 16.1 | 16.2 | 16.2 | |
| Bottom | 12.9 | 13.0 | 13.1 | |
| Difference | 29.0 | 29.2 | 29.3 | |
| Leak Check | OK | OK | OK | |
| Sampling Location: | | | | |
| Port | directly | above Cm | port | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1701 | 1716 | 1731 | |
| Performed by | mmm | mmm | mmm | |

Comments:

probe = 426°F

Run Number 7

## NO$_x$ SAMPLE RECOVERY AND ANALYSIS

### SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 1 | 22 | 2A | |
| Final Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.46 | 29.46 | 29.46 | |
| Flask Temperature (°F) | 71 | 70 | 71 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 0.0 | 0.1 | 0.6 | |
| Bottom | 0.3 | 0.1 | 0.6 | |
| Difference | 0.3 | 0.2 | 1.2 | |
| Sample Number | 901416 | 901417 | 901418 | |
| Date | 1-25-84 | 1-25-84 | 1-25-84 | |
| Clock Time | 1235 | 1515 | 1530 | |
| Performed by | mmm | mmm | mmm | |

### ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901416 | 901417 | 901418 | |
| Absorbance of Sample | 0.131 | 0.315 | 0.151 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of NO$_x$ as NO$_2$ (µg) | 192.6 | 926.3 | 222.0 | |
| Analysis Date | 3-15-84 | 3-15-84 | 3-15-84 | |
| Analyzed by | mmm | mmm | mmm | |

Comments:

Flask #22 had styrofoam peanut in flask

ACUREX CORPORATION

Run Number 8
Date 1-24-84

## NO$_x$ SAMPLING

### PROBE

| Unit No. | Length = | Lining Material | Pre-Filter | Heated | Pitot Tube |
|---|---|---|---|---|---|
| N/A | 3 ft | ☐ S. Steel<br>☒ Pyrex | ☒ Glass Wool<br>☐ ______ | ☒ Yes<br>☐ No | No. N/A<br>Coefficient:<br>☐ .85 ☐ N/A |

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 6A | 20 | 43 | |
| Volume of Flask Less Absorb. Soln. | | 2041 | 2053 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.54 | 29.54 | 29.54 | |
| Flask Temperature (°F) | 67 | 68 | 68 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 16.2 | 16.2 | 16.2 | |
| Bottom | 13.1 | 13.1 | 13.0 | |
| Difference | 29.3 | 29.3 | 29.2 | |
| Leak Check | ok | ok | ok | |
| Sampling Location: | | | | |
| Port | directly above CM port | | | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1801. | 1820 | 1835 | |
| Performed by | mmm | mmm | mmm | |

Comments:

CM Filter change @ 1815
probe temp = 419°F

307735.81

Run Number 8

## NO$_x$ SAMPLE RECOVERY AND ANALYSIS

### SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 6A | 20 | 43 | |
| **Final Conditions:** | | | | |
| Barometric Pressure (in. Hg) | 29.5 | 29.5 | 29.5 | |
| Flask Temperature (°F) | 68 | 72 | 71 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 0.1 | 0.2 | 0.3 | |
| Bottom | 0.3 | 0.3 | 0.2 | |
| Difference | 0.4 | 0.5 | 0.5 | |
| Sample Number | 901419 | 901420 | 901422 | |
| Date | 1-25-84 | 1·25-84 | 1·25-84 | |
| Clock Time | 1235 | 1455 | 1330 | |
| Performed by | mmm | mmm | mmm | |

### ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901419 | 901420 | 901422 | |
| Absorbance of Sample | 0.078 | 0.161 | 0.135 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of NO$_x$ as NO$_2$ (μg) | 114.7 | 236.7 | 198.5 | |
| Analysis Date | 3-15-84 | 3-15-84 | 3·15-84 | |
| Analyzed by | mmm | mmm | mmm | |

Comments:

ACUREX CORPORATION

Run Number 9
Date 1-24-84

## NO$_x$ SAMPLING

### PROBE

Unit No.: N/A

Length = 3 ft

Lining Material: ☐ S. Steel ☒ Pyrex

Pre-Filter: ☒ Glass Wool ☐

Heated: ☒ Yes ☐ No

Pitot Tube: No. N/A
Coefficient: ☐ .85 ☐ N/A

### SAMPLING DATA

| | | | | |
|---|---|---|---|---|
| Flask No. | 19 | 23 | F51 | |
| Volume of Flask Less Absorb. Soln. | 2064 | 2037 | 2053 | |
| Initial Conditions: | | | | |
| Barometric Pressure (in. Hg) | 2954 | 29.54 | 29.54 | |
| Flask Temperature (°F) | 62 | 62 | 63 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 16.3 | 16.2 | 16.3 | |
| Bottom | 13.0 | 13.1 | 13.0 | |
| Difference | 29.3 | 29.3 | 29.3 | |
| Leak Check | OK | OK | OK | |
| Sampling Location: | | | | |
| Port | directly | above Sm | port | |
| Point or Distance from Inside of Port | 1.5' | 1.5' | 1.5' | |
| Clock Time | 1905 | 1920 | 1936 | |
| Performed by | mmm | mmm | mmm | |

Comments:

Probetemp = 487°F

Run Number 9

# $NO_x$ SAMPLE RECOVERY AND ANALYSIS

## SAMPLE RECOVERY

| | | | | |
|---|---|---|---|---|
| Flask No. | 19 | 23 | F51 | |
| Final Conditions: | | | | |
| Barometric Pressure (in. Hg) | 29.46 | 29.46 | 29.46 | |
| Flask Temperature (°F) | 66 | 66 | 71 | |
| Flask Vacuum (in. Hg): | | | | |
| Top | 16.3 | 16.2 | 16.3 | |
| Bottom | 13.0 | 13.1 | 13.0 | |
| Difference | 29.3 | 29.3 | 29.3 | |
| Sample Number | 901422 | 901423 | 901424 | |
| Date | 1-25-84 | 1-25-84 | 1-25-84 | |
| Clock Time | 1139 | 1215 | 1137 | |
| Performed by | mmm | mmm | mmm | |

## ANALYSIS

Analysis Procedure Spectrophotometric

| | | | | |
|---|---|---|---|---|
| Sample Number | 901422 | 901423 | 901424 | |
| Absorbance of Sample | 0.121 | 0.072 | 0.102 | |
| Absorbance of Blank | 0 | 0 | 0 | |
| Calibration Curve No. | 1 | 1 | 1 | |
| Mass of $NO_x$ as $NO_2$ ($\mu g$) | 177.9 | 105.9 | 150.0 | |
| Analysis Date | | | | |
| Analyzed by | | | | |

Comments:

PLANT Chevron (EER) OPERATOR Best

LOCATION SVS 69 outlet

DATE 2-8-84

TIME

INIT FINAL

AMBIENT PRESSURE (IN. HG.) 29.37 29.35
AMBIENT TEMPERATURE (°F)
SAMPLING POINT 30" above CM

TEST NUMBER Run 1

NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1055 | 30 | 2006 | 29.0 | 55 | 0.9 | 58 |
| 1110 | 46 | 2082 | 28.7 | 63 | 1.2 | 58 |
| 1130 | 17 | 2012 | 29.0 | 60 | 1.4 | 59 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION SUS 69 outlet

DATE 2-8-84

TIME

| | INIT | FIN |
|---|---|---|
| AMBIENT PRESSURE (IN. HG.) | 29.37 | 29.35 |
| AMBIENT TEMPERATURE (°F) | | |

SAMPLING POINT 30" above CM

TEST NUMBER Run 2

## NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1155 | 13 | 2075 | 28.5 | 79 | 2.2 | 59 |
| 1210 | 14 | 2049 | 28.7 | 69 | 1.2 | 58 |
| 1225 | 11 | 2055 | 28.9 | 58 | 0.9 | 59 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION SUS 69 outlet

DATE 2-8-84

TIME

INIT FINAL

AMBIENT PRESSURE (IN. HG.) 29.37 29.35
AMBIENT TEMPERATURE (°F)
SAMPLING POINT 30" above CM

TEST NUMBER Run 3

NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1255 | 10 | 2060 | 28.9 | 81 | 0.4 | 59 |
| 1310 | F-52 | 2043 | 28.7 | 70 | +0.2 | 60 |
| 1330 | 25 | 2087 | 28.7 | 73 | 2.2 | 60 |
| | | | | | | |

PLANT Chevron (EZR) OPERATOR Best

LOCATION SUS 69 outlet

DATE 2-8-84

TIME

AMBIENT PRESSURE (IN. HG.) INIT 29.35 FINAL 29.30

AMBIENT TEMPERATURE (°F)

SAMPLING POINT 30" above CM

TEST NUMBER Run 4

## $NO_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1355 | 1 | 1996 | 28.7 | 73 | 2.1 | 61 |
| 1420 | 6 | 2062 | 28.7 | 75 | 1.5 | 62 |
| 1435 | 93 | 2053 | 28.6 | 73 | 0.0 | 61 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR

LOCATION SUS 69 outlet

DATE 2-8-84

TIME

INT FIN

AMBIENT PRESSURE (IN. HG.) 29.35 29.30
AMBIENT TEMPERATURE (°F)
SAMPLING POINT 30" above CM

TEST NUMBER Run 5

NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1610 | 23 | 2037 | 28.6 | 70 | 0.0 | 61 |
| 1635 | 20 | 2041 | 27.2 | 61 | 1.1 | 63 |
| 1650 | 21 | 2081 | 28.5 | 69 | 2.0 | 65 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION SUS-69 outlet

DATE 2-8-84

TIME

IMT FIN

AMBIENT PRESSURE (IN. HG.) 29.30 29.32
AMBIENT TEMPERATURE (°F)
SAMPLING POINT 30" above CM

TEST NUMBER Run 6

NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1710 | 8 | 1995 | 28.5 | 69 | 1.7 | 64 |
| 1725 | 7 | 2046 | 28.5 | 68 | 0.4 | 64 |
| 174 | F51 | 2053 | 28.2 | 69 | 1.1 | 66 |
| | | | | | | |

PLANT Chevron (EOR) OPERATOR Best

LOCATION SRS-69 outlet

DATE 2-8-84

TIME

AMBIENT PRESSURE (IN. HG.) INIT 29.30 FIN 29.32

AMBIENT TEMPERATURE (°F)

SAMPLING POINT 30" above CM

TEST NUMBER Run 7

NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1810 | 5 | 1989 | 28.5 | 68 | 1,2 | 65 |
| 1825 | 1 | 1996 | 28,6 | 72 | 1,6 | 65 |
| 1845 | 7A | | 27,3 | 72 | +0,3" | 65 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION SVS 69 outlet

DATE 2-8-84

TIME

INIT FIN

AMBIENT PRESSURE (IN. HG.) 29.30 29.32
AMBIENT TEMPERATURE (°F)
SAMPLING POINT 30" above CM

TEST NUMBER Run 8

$NO_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1910 | 22 | 2045 | 28.2 | 72 | 1.1 | 67 |
| 1930 | 2A | 2011 | 28.3 | 64 | 0.9 | 67 |
| 1950 | 19 | 2064 | 28.6 | 67 | 1.5 | 67 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION SUS 69 outlet

DATE 2-8-84

TIME

AMBIENT PRESSURE (IN. HG.) INIT 29.30 FIN 29.32
AMBIENT TEMPERATURE (°F)
SAMPLING POINT 30" above CM

TEST NUMBER Run 9

NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 2010 | 18 | 2079 | 28.0 | 65 | 0.0 | 67 |
| 2025 | 16 | 2017 | 28.6 | 79 | 0.0 | 68 |
| 2040 | 9 | 2077 | 28.6 | 74 | | |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION Outlet

DATE 2-29-84

TIME

| | INITIAL | FINAL |
|---|---|---|
| AMBIENT PRESSURE (IN. HG.) | 29.32 | 29.50 |
| AMBIENT TEMPERATURE (°F) | 65 | |

SAMPLING POINT 10

TEST NUMBER Run 1

NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1214 | 23 | 2037 | 29.2 | 65 | 0.2 | 43 |
| 1233 | 10 | 2060 | 28.9 | 69 | 0.0 | 43 |
| 1249 | 8 | 1995 | 28.9 | 73 | 2.8 | 43 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION Outlet

DATE 2-2484

TIME

| | INITIAL | FINAL |
|---|---|---|
| AMBIENT PRESSURE (IN. HG.) | 29.32 | 29.50 |
| AMBIENT TEMPERATURE (°F) | 65 | |

SAMPLING POINT 10

TEST NUMBER run 2

## NO$_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions Flask Vacuum (in. Hg.) | Initial Conditions Flask Temp (°F) | Final Conditions Flask Vacuum (in. Hg.) | Final Conditions Flask Temp (°F) |
|---|---|---|---|---|---|---|
| 1314 | 10 | 2060 | 29.0 | 64 | 3.0 | 43 |
| 1329 | 43 | 2053 | 28.1 | 73 | 0-0 | 43 |
| 1346 | FS2 | 2043 | 29.0 | 74 | 1.7 | 43 |
| | | | | | | |

PLANT Chevron (EER) OPERATOR Best

LOCATION Outlet

DATE 2-24-84

TIME

| | INITIAL | FINAL |
|---|---|---|
| AMBIENT PRESSURE (IN. HG.) | 27.32 | 29.50 |
| AMBIENT TEMPERATURE (°F) | 65 | |

SAMPLING POINT 10

TEST NUMBER Run 3

## $NO_x$ SAMPLING DATA

| Time | Flask Number | Flask Volume (ml.) | Initial Conditions | | Final Conditions | |
|---|---|---|---|---|---|---|
| | | | Flask Vacuum (in. Hg.) | Flask Temp (°F) | Flask Vacuum (in. Hg.) | Flask Temp (°F) |
| 1414 | 2A | 2011 | 28.7 | 69 | 3.3 | 44 |
| 1429 | 7 | 2046 | 28.8 | 71 | 3.1 | 45 |
| 1445 | 19 | 2064 | 28.9 | 70 | 0.4 | 47 |
| | | | | | | |

# SECTION 5

# ANALYTICAL RESULTS

5.1 Fuel Proximate and Ultimate Analyses

5.2 Particulate and Sulfur Oxides Emissions from Method 5/8 Samples

5.3 Particulate Emissions from SASS Samples

5.4 Particulate Emissions and Size Distributions from Andersen Samples

5.5 Sulfur Oxides Emissions from Controlled Condensation System Samples

5.6 Trace Element Analyses of Fuel and SASS Samples

5.7 Organic Analyses of SASS Samples: Total Chromatographable Organics (TCO), Gravimetric Organics (GRAV), Gas Chromatography Mass Spectrometry (GC/MS), and Infrared (IR) Spectra of Total Sample Extracts

5.8 Volatile Organics Analyses of VOST Traps

5.9 $N_2O$ Emissions by GC/ECD

5.10 $NO_x$ Emissions by EPA Method 7

## 5.1 FUEL PROXIMATE AND ULTIMATE ANALYSES

LABORATORY CERTIFICATE

ORIGINAL

**CURTIS & TOMPKINS, LTD.**
ESTABLISHED 1878
Bulk Oil & Chemical Surveyors, Samplers & Weighers
Analytical & Consulting Chemists

SOUTHERN DIVISION
401 Canal Street
Wilmington, CA 90744-6503
213-549-6740

290 Division Street
San Francisco, CA 94103-4882
415-861-1863
Telex: 171042
CABLE: ANALYST SFO

FOOD TECHNOLOGISTS

ENVIRONMENTAL ANALYSTS

MEMBERS, OFFICIAL CHEMISTS
AND/OR SAMPLERS FOR GOVERNMENT
AGENCIES AND TRADE ORGANIZATIONS

|  |  |
|---|---|
| *Laboratory No.* | 84e34 |
| *Preliminary No.* | 7758 |
| *Reported* | 5/3/84 |
| *Sampled* | -------- |
| *Received* | 3/23/84 |

*For* ACUREX CORPORATION

*Report on* 1 sample of Fuel

*Mark*
Sample No. 901440
Subcontract No. RB59186A
Release No. 13
Prime Contract 62-02-3176
Acurex Project No. 7951

ULTIMATE ANALYSIS

|  |  |
|---|---|
| Carbon | 86.2 |
| Hydrogen | 11.3 |
| Oxygen | 0.4 |
| Sulfur (1st test) | 1.00 |
| Sulfur (2nd test) | 1.10 |
| Sulfur (3rd test) | 1.08 |
| Nitrogen (1st test) | 1.04 |
| Nitrogen (2nd test) | 1.09 |
| Nitrogen (3rd test) | 1.00 |

PROXIMATE ANALYSIS

|  |  |
|---|---|
| Gross Heating Value, BTU per lb. | 18,430 |
| Moisture | 0.57 |
| Ash | 0.03 |
| Specific Gravity (API)@ +60°F | 12.6 |

Curtis & Tompkins Ltd.

## 5.2 PARTICULATE AND SULFUR OXIDES EMISSIONS FROM METHOD 5/8 SAMPLES

# ISOKINETIC PERFORMANCE WORKSHEET & PARTICULATE CALCULATIONS

Plant CHEV/EER
Performed by DuRos
Date 2-6-84
Sample Location
Test No./Type 1 /M-5/8

| | | |
|---|---|---|
| Barometric Pressure (in. Hg) | $P_b$ | 29.28 |
| Meter volume (std), $17.64\left(\frac{V_m}{\alpha}\right)\left(\frac{P_b+\frac{\Delta H}{13.6}}{T_m+460}\right)$<br>$17.64\left(\frac{(56.635)}{(.995)}\right)\left(\frac{(29.28)+\frac{(2.075)}{13.6}}{(69.9)+460}\right)$ | $V_{m\ std}$ | 55.772 |
| Volume of liquid collected (grams) | $Vl_c$ | NO DATA |
| Volume of liquid at standard condition (scf)<br>$Vl_c \times 0.04707$ | $V_{w\ std}$ | 6.047 1/ |
| Stack gas proportion of water vapor<br>$\frac{V_{w\ std}}{V_{w\ std}+V_{m\ std}}$, $\frac{(\_\_\_)}{(\_\_\_)+(\_\_\_)}$ | $B_{wo}$ | 0.0978<br>From Run 2 |
| Molecular weight, stack gas dry (lb/lb-mole)<br>(% $CO_2$ x 0.44) + (% $O_2$ x 0.32) + (% $N_2$ + % CO x 0.28)<br>(14.9 x 0.44) + (2.9 x 0.32) + (82.2 + ___ x 0.28)<br>6.556 + .928 + 23.016 | $M_d$ | 30.5<br>PRELIMINARY DATA |
| Molecular weight, stack gas wet (lb/lb-mole)<br>$Md(1-B_{wo}) + 18(B_{wo})$, (30.5)(1-.0978) + 18(.0978) | $M_s$ | 29.28<br>BASED ON PRELIM. DATA |
| Absolute stack pressure (in. Hg)<br>$P_b + \frac{P_{stack}\ (\text{in. } H_2O)}{13.6}$, $(29.28) + \frac{(+.2)}{13.6}$ | $P_s$ | 29.29 |

1/ BACK CALCULATED BASED ON RUN 2 DATA

RUN 1 / M-5/8 CHEV/EER

| | | |
|---|---|---|
| Temperature stack gas, average (°F) | $T_s$ | 456.2 |
| Stack velocity (fps)<br>$85.49\,(C_p)\,(\sqrt{\Delta P}_{s\ avg})\sqrt{\dfrac{T_s avg + 460}{P_s \quad M_s}}$<br>$85.49\,(\overset{2\checkmark}{.79})(\sqrt{.649})^2\sqrt{\dfrac{(456.2) + 460}{(29.29)(29.28)}}$ | $V_{s(avg)}$ | 45.30 |
| Total sample time (minutes) | $\theta$ | 72 |
| Nozzle diameter, actual (inches) | $N_d$ | .309 |
| Percent isokinetic (%)<br>$\dfrac{17.33\,(T_s + 460)(V_w\ std + V_m\ std)}{\theta \quad V_s \quad P_s \quad N_d^2}$<br>916.2 61.819<br>$\dfrac{17.33\,(456.2 + 460)((6.047) + (55.772))}{(72)(45.30)(29.29)(.309)^2}$ | %I | 107.6 |
| Area of stack (ft²) $\pi = 3.1416$ 36" DIAM<br>$\pi r^2 \div 144, \quad \pi(18)^2 \div 144$ | $A_s$ | 7.069 |
| Stack gas volume at standard conditions (dscfm)<br>$60\,(1 - B_{wo})Vs_{avg}\,A_s\left(\dfrac{528}{T_s\ avg + 460}\right)\left(\dfrac{Ps}{29.92}\right)$<br>$60\,(1 - .0978)(45.30)(7.069)\left(\dfrac{528}{456.2 + 460}\right)\left(\dfrac{(29.29)}{(29.92)}\right)$ | $Q_s$ | 9,779 |
| Particulate matter concentration, dry (gr/dscf)<br>$15.432\,\dfrac{M_p(grams)}{Vm_{std}}, \quad 15.432\,\dfrac{(\_\_\_\_)}{(\_\_\_\_)}$ | $C_{s(std)}$ | |
| Emission rate of particulate matter (lb/hr)<br>$0.00857\,(Q_s)\,C_{s(std)}, \quad 0.00857\,(\_\_\_\_)(\_\_\_\_)$ | $E_p$ | |

2) ASSUMED

## ISOKINETIC PERFORMANCE WORKSHEET & PARTICULATE CALCULATIONS

Plant CHEV/EER
Date 2-6-84
Sample Location OUTLET STACK
Test No./Type 2 / M-5/8

Performed by DaRos

| | | |
|---|---|---|
| Barometric Pressure (in. Hg) | $P_b$ | 29.28 |
| Meter volume (std), $17.64 \left(\frac{V_m}{\alpha}\right)\left(\frac{P_b + \frac{\Delta H}{13.6}}{T_m + 460}\right)$<br>$17.64 \left(\frac{\overset{57.943}{(\underline{\quad})}}{(.995)}\right)\left(\frac{(29.28) + \frac{(2.18)}{13.6}}{(77.8) + 460}\right)$ | $V_{m\ std}$ | 56.223 |
| Volume of liquid collected (grams) | $Vl_c$ | 129.5 |
| Volume of liquid at standard condition (scf)<br>$Vl_c \times 0.04707$ | $V_{w\ std}$ | 6.096 |
| Stack gas proportion of water vapor<br>$\frac{V_{w\ std}}{V_{w\ std} + V_{m\ std}}, \frac{(6.096)}{(6.096) + (56.223)}$ | $B_{wo}$ | 0.0978 |
| Molecular weight, stack gas dry<br>(lb/lb-mole)<br>$(\%\ CO_2 \times 0.44) + (\%\ O_2 \times 0.32) + (\%\ N_2 + \%\ CO \times 0.28)$<br>$(\underline{\quad} \times 0.44) + (\underline{\quad} \times 0.32) + (\underline{\quad} + \underline{\quad} \times 0.28)$ | $M_d$ | 30.5<br>PRELIMINARY DATA (SEE RUN 1) |
| Molecular weight, stack gas wet<br>(lb/lb-mole)<br>$Md(1-B_{wo}) + 18(B_{wo}), (\underline{\quad})(1-\underline{\quad}) + 18(\underline{\quad})$ | $M_s$ | 29.28<br>BASED ON PRELIM. DATA (SEE RUN 1) |
| Absolute stack pressure (in. Hg)<br>$P_b + \frac{P_{stack}\ (\text{in. } H_2O)}{13.6}, (29.28) + \frac{(0.2)}{13.6}$ | $P_s$ | 29.29 |

7602/5/81/Rev 1

RUN 2 / M-519 CHEV/EER

| | | |
|---|---|---|
| Temperature stack gas, average ($^{o}F$) | $T_s$ | 479.1 |
| Stack velocity (fps)<br>$85.49\ (C_p)\ (\sqrt{\Delta P}_{s\ avg})\ \sqrt{\frac{T_s avg + 460}{P_s\ \ M_s}}$<br>$85.49\ (\overset{1/}{\underline{.79}})(\sqrt{.6696})^2\ \sqrt{\frac{(\underline{479.1}) + 460}{(\underline{29.29})(\underline{29.28})}}$ | $V_{s(avg)}$ | 47.32 |
| Total sample time (minutes) | $\theta$ | 72 |
| Nozzle diameter, actual (inches) | $N_d$ | .309 |
| Percent isokinetic (%)<br>$\frac{17.33\ (T_s + 460)(V_w\ std + V_m\ std)}{\theta\ \ V_s\ \ P_s\ \ N_d^2}$<br>$\frac{17.33\ (\overset{939.1}{\underline{479.1} + 460})((\underline{6.096}) + \overset{62.319}{(\underline{56.223})})}{(\underline{\ 72\ })(\underline{47.32})(\underline{29.29})(\underline{.309})^2}$ | %I | 106.44 |
| Area of stack ($ft^2$) $\pi = 3.1416$<br>$\pi r^2 \div 144$, $\pi(\underline{18})^2 \div 144$ | $A_s$ | 7.069 |
| Stack gas volume at standard conditions (dscfm)<br>$60\ (1 - B_{wo})Vs_{avg}\ A_s \left(\frac{528}{T_s\ avg + 460}\right) \left(\frac{Ps}{29.92}\right)$<br>$60\ (1 - \underline{.0978})(\underline{47.32})(\underline{7.069})\left(\frac{528}{\underline{479.1} + 460}\right) \left(\frac{(\underline{29.29})}{(29.92)}\right)$ | $Q_s$ | 9,966 |
| Particulate matter concentration, dry (gr/dscf)<br>$15.432\ \frac{M_p(grams)}{Vm_{std}}$, $15.432\ \frac{(\_\_\_\_)}{(\_\_\_\_)}$ | $C_{s(std)}$ | |
| Emission rate of particulate matter (lb/hr)<br>$0.00857\ (Q_s)\ C_{s(std)}$, $0.00857\ (\_\_\_\_)(\_\_\_\_)$ | $E_p$ | |

1/ ASSUMED

# ACUREX
# ANALYTICAL REPORT

Sample of: CMEA

Sample Date: 2-1-84

Requested By: LARRY WATERLAND, PhD

I.D. Number: 307735.81

Analytical Method: Gravimetric Analyses of EPA 5/8 Front Filters ; Probe WASHES

Date of Analysis: 2-9-84

| Lab I.D. Number | Filter # OR TOTAL VOL. ACETONE<br>Component | FINAL - TARE = NET WT<br>Analytical Result | Unit |
|---|---|---|---|
| 901479 (Filter Blank) | 84-95.3-001 | 0.47822 - 0.47824 = -0.00002 g | grams of Particulate ↓ |
| 901467 (Filter, Run#1) | 84-953-010 | 0.57543 - 0.48021 = 0.09522 g | |
| 901471 (Filter, Run#2) | 84-95.3-008 | 0.59386 - 0.47772 = 0.11614 g | |
| 901478 (ACETONE BLANK) | 450 MLS | 1.46443 - 1.46365 = 0.00078 g/450 mls = $1.73333 \times 10^{-6}$ g/mL ACE. | |
| 901446 (Probe WASH, Run#1) | 126 mLs | 1.47268 - 1.46736 = 0.00532 | |
| 901468 (Probe WASH, Run#2) | 176 mLs | 1.55860 - 1.47117 = 0.08743 g | |

NB.: ALL REPORTED VALUES HAVE NOT Been corrected for Blanks.

Analysis By Martha M. Murray

Date 3-12-84

# ACURIX
# ANALYTICAL REPORT

**Sample of:** CMEA/EER

**Sample Date:** 2-1-84

**Requested By:** L. Waterland

**I.D. Number:** 307735.81

**Analytical Method:** Gravimetric Analyses of method 5/8 Condensibles

**Date of Analysis:** 3/13 - 3/16/84

| Lab I.D. Number | Component<br>TOTAL VOLUME/ALIQUOT | Analytical Result | Unit |
|---|---|---|---|
| 901447<br>Run #1 | 224/50 | 0.13700 | grams |
| | 224/50 | 0.13422 | ↓ |
| 901469<br>Run #2 | 257/50 | 0.02631 | ↓ |
| | 257/50 | 0.02092 | ↓ |
| 901466<br>IPA Blank | 50 mls | 0.00041 | ↓ |

N.B. All samples were analyzed in duplicate and the results reported have been blank corrected

**Analysis By** Martha M. Murray

**Date** 3-16-84

Form EED- 082 5/81

# ACUREX
# ANALYTICAL REPORT

**Sample of:** CMEA

**Sample Date:** 2-1-84

**Requested By:** LARRY WATERLAND

**I.D. Number:** 307735.81

**Analytical Method:** SULFATE TITRATIONS OF EPA 5/8 IMPINGER CATCHES

**Date of Analysis:** 2-6-84

| Lab I.D. Number | TOTAL VOL/ALIQ. Component | Analytical Result | Unit |
|---|---|---|---|
| 901447 (Imp. #1 + Filter, TEST #1) | 174 mls / 25 mls | 82.72 | TOTAL mg sulfate per sample |
| 901450 + 901452 (Imp. 2+3, TEST #1) | 338 mls / $\frac{5}{100}$ ×10 mls | 3968.4 | |
| 901469 (Imp. #1 + FILTER, TEST #2) | 207 mls / 25 mls | 28.33 | |
| 901472 (Imp. #2 + 3, Test #2) | 362 mls / $\frac{5}{100}$ ×10 mls | 3,833<br>(100.1% recovery on spike) | |
| 901466 (80% IPA + Filter BLANK) | 328 mls / 25 mls | 0.00<br>(INSTANT ENDPOINT) | |
| 901465 (6% $H_2O_2$ BLANK) | 196 mls / 10 mls | 0.00<br>(INSTANT ENDPOINT) | |
| * EPA STANDARDS (SUBMITTED BY B.DAROS) #2A (Lot 0881 #2337)* | 100 mls / 10 mls | 1294.9 | mg/DSCM |
| #3A (Lot 0881 #5333)** | 100 mls / 10 mls | 200.7 | |

STANDARDIZATION OF $BaCl_2 \cdot 2H_2O$:

2-6-84: $V_2$ = 10 mls; $N_2$ = 0.01; $V_1$ = 9.98, 10.03 (10.01 mls AVERAGE);

$N_1$ = 0.0100 N

**Analysis By** Martha M. Murray

**Date** 3-13-84

* True value = 1296.4 mg/dscm

** " = 190.7 mg/dscm

## 5.3 PARTICULATE EMISSIONS FROM SASS SAMPLES

## ISOKINETIC PERFORMANCE WORKSHEET & PARTICULATE CALCULATIONS

Plant CHEVRON USA /EERC burner Performed by Parker ?

Date 12-5-84

Sample Location Steam Outlet

Test No./Type SASS

| | | |
|---|---|---|
| Barometric Pressure (in. Hg) | $P_b$ | |
| Meter volume (std), $17.64 \left(\frac{V_m}{\alpha}\right)\left(\frac{P_b + \frac{\Delta H}{13.6}}{T_m + 460}\right)$<br>$17.64 \left(\frac{(866.4)}{(1.039)}\right)\left(\frac{(29.9) + \frac{(1.9)}{13.6}}{(95) + 460}\right)$ | $V_{m\ std}$ | 796 |
| Volume of liquid collected (grams) | $Vl_c$ | 1920 |
| Volume of liquid at standard condition (scf)<br>$Vl_c \times 0.04707$ | $V_{w\ std}$ | 90.37 |
| Stack gas proportion of water vapor<br>$\frac{V_{w\ std}}{V_{w\ std} + V_{m\ std}}$, $\frac{(90.37)}{(796) + (90.37)}$ | $B_{wo}$ | 0.103 |
| Molecular weight, stack gas dry<br>(lb/lb-mole)<br>(% $CO_2$ x 0.44) + (% $O_2$ x 0.32) + (% $N_2$ + % CO x 0.28)<br>(13.1 x 0.44) + (2.7 x 0.32) + (84.2 + ____ x 0.28) | $M_d$ | 30.2 |
| Molecular weight, stack gas wet<br>(lb/lb-mole)<br>$Md(1-B_{wo}) + 18(B_{wo})$, (30.2)(1-0.103) + 18(0.103) | $M_s$ | 28.9 |
| Absolute stack pressure (in. Hg)<br>$P_b + \frac{P_{stack}\ (\text{in. } H_2O)}{13.6}$, $(29.3) + \frac{(\_\_\_\_)}{13.6}$ | $P_s$ | 29.3 |

Form 440 3/84

| | | |
|---|---|---|
| Temperature stack gas, average ($^{o}F$) | $T_s$ | 456 |
| Stack velocity (fps)<br>$85.49\,(C_p)\,(\sqrt{\Delta P_{s\ avg}})\,\sqrt{\frac{T_s avg + 460}{P_s\ \ M_s}}$<br>$85.49\,(\underline{0.816})(\sqrt{\overset{0.632}{\underline{\qquad}}})\,\sqrt{\frac{(\underline{456}) + 460}{(\underline{29.3})(\underline{28.9})}}$ | $V_{s(avg)}$ | 45.8 |
| Total sample time (minutes) | $\theta$ | 240 |
| Nozzle diameter, actual (inches) | $N_d$ | 0.674 |
| Percent isokinetic (%)<br>$\frac{17.33\,(T_s + 460)(V_w \text{ std} + V_m \text{ std})}{\theta\quad V_s\quad P_s\quad N_d^2}$<br>$\frac{17.33\,(\underline{456} + 460)((\underline{90.4}) + (\underline{796}))}{(\underline{240})(\underline{45.8})(\underline{29.3})(\underline{^{2}0.674})}$ | %I | 96.2 |
| Area of stack ($ft^2$) $\pi = 3.1416$<br>$\pi r^2 \div 144, \quad \pi(\underline{\qquad})^2 \div 144$ | $A_s$ | 7.069 |
| Stack gas volume at standard conditions (dscfm)<br>$60\,(1 - B_{wo})Vs_{avg}\,A_s\left(\frac{528}{T_s\ avg + 460}\right)\left(\frac{Ps}{29.92}\right)$<br>$60\,(1 - \underline{0.103})(\underline{45.8})(\underline{7.069})\left(\frac{528}{\underline{456} + 460}\right)\left(\frac{(\underline{29.3})}{(29.92)}\right)$ | $Q_s$ | 9836 |
| Particulate matter concentration, dry (gr/dscf)<br>$15.432\,\frac{M_p(\text{grams})}{Vm_{std}}, \qquad 15.432\,\frac{(\underline{\qquad})}{(\underline{\qquad})}$ | $C_{s(std)}$ | |
| Emission rate of particulate matter (lb/hr)<br>$0.00857\,(Q_s)\,C_{s(std)}, \ 0.00857\,(\underline{\qquad})(\underline{\qquad})$ | $E_p$ | |

## SASS ANALYTICAL DATA

Plant EPA Sample No. —
Sampling Location Chevron EER Run No. 1
Recovered By C. Beeman Recovery Date 2-1-84 Run Date 2-1-84
Comments
Analyst Responsible
Calculations and Report Reviewed By Report Date

**FILTERS USED**

No.

**CYCLONES**

| | Used (yes/no) | Pretared Container (No.) |
|---|---|---|
| 10μ | | |
| 3μ | | |
| 1μ | | |

**IMPINGER VOLUMES**

| | Initial | Final | |
|---|---|---|---|
| First ($H_2O_2$) | 500 ml | 547 ml | 53 ml rinse |
| Second (APS + $AgNO_3$) | 500 ml | } 840 ml | 100 ml. rinse |
| Third (APS + $AgNO_3$) | 500 ml | ml | |
| TOTALS | 1500 ml | ml | Gain ml |

**SILICA GEL WEIGHTS**

| Initial | Final | |
|---|---|---|
| 1089.8 g | 1322.6 g | silica gel totally spent |
| 973.7 g | 1116.2 g | |
| g | g | |
| TOTALS g | g | Gain g |

**CONDENSATE**

TOTAL VOLUME COLLECTED 1920 ml
Volume Neat ~~1920~~ ml
Volume Extracted ml
Volume $CH_2Cl_2$ Extract (3 x ____ ml) ml

Ph - 13

Extracted Condensate: pH Neat
Amount 96% $HNO_3$ added
pH Final

TOTAL GAIN ml

Note: Imp. solutions and condensate were bubbling

# ACUREX
# ANALYTICAL REPORT

Sample of: CMEA / EER

Sample Date: 2-1-84

Requested By: L Waterland

I.D. Number: 307735.81

Analytical Method: Gravimetric Analyses of SASS filters and probe wash

Date of Analysis: 2/9 & 3/13/84

| Lab I.D. Number | Component (Filter # or Volume) | Analytical Result | Unit |
|---|---|---|---|
| 901460 (probe/nozzle rinse) | 117 mLs | 0.05014 | grams |
| 901481 ($MeCl_2$ blank) | 50 mLs | −0.00008 | |
| 901458 | 84-142-034 | 0.12175 | |
| 901459 (Filter Blank) | 84-142-035 | 0.00005 | |
| 901457 | 84-142-033 | 0.12797 | |
| 901456 | 84-142-032 | 0.15379 | |
| 901455 | 84-142-031 | 0.11046 | |

NB: ALL RESULTS HAVE BEEN BLANK CORRECTED

Analysis By Martha M. Murray

Date 3-16-84

## 5.4 PARTICULATE EMISSIONS AND SIZE DISTRIBUTIONS FROM ANDERSEN SAMPLES

**ACUREX Corporation**

EER
Andersen #1
2-22-84

# PARTICULATE CALCULATIONS

1. Volume of dry gas sampled at standard conditions, 68° F, 29.92 inch Hg (scf)

$$Vm_{std} \quad 17.64 \frac{Vm}{\alpha}\left(\frac{P_b + \frac{\Delta H}{13.6}}{T_{m,avg} + 460}\right) = 17.64 \; \frac{14.982}{1.001}\left(\frac{29.36 + \frac{0.9}{13.6}}{65.2 + 460}\right) = 14.793$$

$$\text{or} \quad Vm_{stack} = \left(\frac{Vm}{\alpha(1 - B_{wo})}\right)\left(\frac{T_{s,avg} + 460}{T_{m,avg} + 460}\right)\left(\frac{P_m}{P_s}\right) \quad \text{(acf at stack conditions)}$$

=

2. Stack gas moisture condensed at standard conditions (scf)

$$Vw_{std} = 0.04707 \; Vl_c = \frac{Vm_{std}(B_{wo})}{1 - B_{wo}} \qquad = 1.941$$

=

3. Stack gas proportion of water vapor, by volume

$$B_{wo} = \frac{Vw_{std}}{Vw_{std} + Vm_{std}}$$

= 11.60%

4. Stack gas dry molecular weight (lb/lb-mole)

$$MW_d = 0.44\;(\%\overset{13.0}{CO_2}) + 0.32\;(\%\overset{3.0}{O_2}) + 0.28\;(\%\overset{84.0}{N_2 + \%CO})$$

= 30.20

5. Stack gas molecular weight (lb/lb-mole)

$$MW_s = MW_d\;(1 - B_{wo}) + 18\;(B_{wo})$$

= 28.78

6. Pressure stack, in. Hg

$$P_s = P_b + \frac{P_{st}}{13.6}$$

$$= 29.36 + \frac{-.25}{13.6} = 29.34$$

7. Stack gas velocity at stack conditions (ft/sec)

$$V_s = 85.49\ (C_p)\ (\sqrt{\Delta P})_{avg} \sqrt{\frac{T_{s,avg} + 460}{P_s\ MW_s}}$$

$$= 85.49\,(\overset{.82}{\cancel{.84}})(.663)\sqrt{\frac{531.5+460}{(29.30)(28.93)}} = 50.267$$

8. Stack gas volume at standard conditions (scfm)

$$Q_s = 60\ (1 - B_{wo})\ Vs_{avg}\ A_s \left(\frac{528}{T_{s,avg} + 460}\right)\left(\frac{P_s}{29.92}\right) =$$

or $Q_a = 60\ Vs_{avg}\ A_s$ (acfm) =

9. Test percent isokinetic

$$\%I = \frac{17.33(T_{s,avg} + 460)\ [Vw_{std} + Vm_{std}]}{\theta V_s P_s D_n^{\ 2}} = \frac{17.33(T_s + 460)(Vm_{std})}{\theta V_s P_s D_n^{\ 2}(1 - B_{wo})}$$

$$= \frac{17.33(991.5)\ (16.590)}{(30.0)(\underset{50.267}{\cancel{50.796}})(29.30)(.250)^2} = 102.91\%$$

10. Particulate matter concentration, gr/scf

$$C_s = 15.432\ \frac{M_p}{Vm_{std}} = \quad 0.0167$$

or $C_a = 15.432\ \dfrac{M_p}{Vm_{stack}}$ (gr/acf) =

11. Emission rate of particulate matter, lb/hr

$$ER = 0.00857\ (Q_s)\ C_s$$

=

12. Percent excess air at sampling point

$$\%\ EA = \frac{100\ [\%O_2 - 0.5\ (\%CO)]}{0.264\ \ \%N_2 - (\%O_2 - 0.5 \times \%CO)} =$$

13. Emission rate of particulate matter, lb/$10^6$ Btu

$$E = 2.679 \times 10^{6} \left(\frac{M_p}{Vm_{std}}\right) F \left(\frac{20.9}{20.9 - \%O_2}\right)$$

=

**ACUREX Corporation**

EER

## PARTICULATE CALCULATIONS

andersen #2

2-22-84

1. Volume of dry gas sampled at standard conditions, 68° F, 29.92 inch Hg (scf)

$$Vm_{std} \quad 17.64\,\frac{Vm}{\alpha}\left(\frac{P_b + \frac{\Delta H}{13.6}}{T_{m,avg} + 460}\right) = 17.64\,\frac{14.676}{1.001}\left(\frac{29.32 + \frac{0.9}{13.6}}{59.8+460}\right) = 14.621$$

$$\text{or} \quad Vm_{stack} = \left(\frac{Vm}{\alpha(1 - B_{wo})}\right)\left(\frac{T_{s,avg} + 460}{T_{m,avg} + 460}\right)\left(\frac{P_m}{P_s}\right) \quad \text{(acf at stack conditions)}$$

=

2. Stack gas moisture condensed at standard conditions (scf)

$$Vw_{std} = 0.04707\ Vl_c = \frac{Vm_{std}(B_{wo})}{1 - B_{wo}} \qquad = 1.919$$

=

3. Stack gas proportion of water vapor, by volume

$$B_{wo} = \frac{Vw_{std}}{Vw_{std} + Vm_{std}}$$

= 11.60%

4. Stack gas dry molecular weight (lb/lb-mole)

14.1 ~~2.58~~ 2.6 83.3

$$MW_d = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

= 30.36

5. Stack gas molecular weight (lb/lb-mole)

$$MW_s = MW_d\ (1 - B_{wo}) + 18\ (B_{wo})$$

= 28.93

6. Pressure stack, in. Hg

$$P_s = P_b + \frac{P_{st}}{13.6}$$

$$= 29.32 + \frac{-0.25}{13.6} = 29.30$$

7. Stack gas velocity at stack conditions (ft/sec)

$$V_s = 85.49\ (C_p)\ (\sqrt{\Delta P})_{avg} \sqrt{\frac{T_{s,avg} + 460}{P_s\ MW_s}}$$

$$= 85.49\ \overset{82}{(.84)}(.663)\sqrt{\frac{552.5+460}{(29.34)(28.78)}} = 50.894$$

8. Stack gas volume at standard conditions (scfm)

$$Q_s = 60\ (1 - B_{wo})\ Vs_{avg}\ A_s \left(\frac{528}{T_{s,avg} + 460}\right)\left(\frac{P_s}{29.92}\right) =$$

$$\text{or}\ \ Q_a = 60\ Vs_{avg}\ A_s\ (\text{acfm}) =$$

9. Test percent isokinetic

$$\%I = \frac{17.33(T_{s,avg} + 460)\ [Vw_{std} + Vm_{std}]}{\theta V_s P_s D_n^{\ 2}} = \frac{17.33(T_s + 460)(Vm_{std})}{\theta V_s P_s D_n^{\ 2}(1 - B_{wo})}$$

$$= \frac{17.33(1012.5)\ (16.734)}{(30.15)(50.894)(29.34)(.250)^2} = 104.35\ \%$$

10. Particulate matter concentration, gr/scf

$$C_s = 15.432\ \frac{M_p}{Vm_{std}} = 0.0134$$

$$\text{or}\ \ C_a = 15.432\ \frac{M_p}{Vm_{stack}}\ (\text{gr/acf}) =$$

11. Emission rate of particulate matter, lb/hr

$$ER = 0.00857\ (Q_s)\ C_s$$

$$=$$

12. Percent excess air at sampling point

$$\%\ EA = \frac{100\ [\%O_2 - 0.5\ (\%CO)]}{0.264\ \ \%N_2 - (\%O_2 - 0.5 \times \%CO)} =$$

13. Emission rate of particulate matter, lb/10⁶ Btu

$$E = 2.679 \times 10^6 \left(\frac{M_p}{Vm_{std}}\right) F \left(\frac{20.9}{20.9 - \%O_2}\right)$$

$$=$$

**ACUREX Corporation**

# ANDERSEN PARTICLE SIZE ANALYSIS

Plant CHEVRON SVS-69
Test Location SVS-69 Outlet
Run No. 1
Flow Rate 1.08 ACFM

Tare Weights:
Date 2/13/84
By K. BREWSTER
Location Mt View

Final Weights:
Date 3/5/84
By K. BREWSTER
Location Mt View

| STAGE NO | FILTER NO | FINAL WT (g) | TARE WT (g) | SAMPLE WT (g)[a] | % OF TOTAL WT[b] | CUMULATIVE % OF TOTAL WT[b] | Dp μ |
|---|---|---|---|---|---|---|---|
| 0 | UOP-23-1 | 1,23277 | 1,23293 | ~~0~~ | | 100.00 | 7.52 |
| 1 | UOP-23-2 | 1,23529 | 1,21493 | 0.00020 | 1.55 | 98.45 | 7.11 |
| 2 | UOP-23-3 | 1,21700 | 1,21627 | 0.00057 | 4.42 | 94.03 | 4.35 |
| 3 | UOP-23-4 | 1,21362 | 1,21319 | 0.00027 | 2.09 | 91.94 | 3.03 |
| 4 | UOP-23-5 | 1,21782 | 1,21744 | 0.00022 | 1.71 | 90.23 | 1.57 |
| 5 | UOP-23-6 | 1,20114 | 1,20039 | 0.00059 | 4.58 | 85.65 | .78 |
| 6 | UOP-23-7 | 1,22987 | 1,22893 | 0.00078 | 6.05 | 79.60 | .48 |
| 7 | UOP-23-8 | 1,20792 | 1,20685 | 0.00091 | 7.06 | 72.54 | .22 |
| F | UOP-23-F | 1,28680 | 1,27712 | 0.00935 | 72.54 | | |
| | | | TOTAL WITH FILTER | 12.89 mg | | | |
| | | | TOTAL WITHOUT FILTER | 3.54 mg | | | |

Blank correction value = -0.00016 Stages 0 through 7

Blank correction value = -0.00033 Stage F (final filter)

[a] Includes appropriate blank corection factor.

[b] Calculations based on total sample weight with filter are entered on first line; calculations based on total sample weight without filter are entered on second line for each stage.

Comments: Cyclone rinse = 0 mg

13.04 um Dp50

Form EED-070 C 6 79

**ACUREX Corporation**

# ANDERSEN PARTICLE SIZE ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| Plant | CHEVRON SVS-69 | Tare Weights: | | Final Weights: | |
| Test Location | SVS-69 Outlet | Date | 2/13/84 | Date | 3/5/84 |
| Run No. | 2 | By | K. BREWSTER | By | K. BREWSTER |
| Flow Rate | 1.05 ACFM | Location | Mt View | Location | Mt View |

| STAGE NO. | FILTER NO. | FINAL WT (g) | TARE WT (g) | SAMPLE WT (g)[a] | % OF TOTAL WT[b] | CUMULATIVE % OF TOTAL WT[b] | Dp µ |
|---|---|---|---|---|---|---|---|
| 0 | UOP-20-1 | 1,24019 | 1,23960 | 0.00043 | 2.72 | 89.63 | 7.55 |
| 1 | UOP-20-2 | 1,21855 | 1,21781 | 0.00058 | 3.67 | 85.96 | 7.15 |
| 2 | UOP-20-3 | 1,23509 | 1,23447 | 0.00046 | 2.91 | 83.05 | 4.37 |
| 3 | UOP-20-4 | 1,21236 | 1,21164 | 0.00056 | 3.54 | 79.51 | 3.04 |
| 4 | UOP-20-5 | 1,23021 | 1,22926 | 0.00079 | 5.00 | 74.51 | 1.58 |
| 5 | UOP-20-6 | 1,21475 | 1,21369 | 0.00090 | 5.69 | 68.82 | .79 |
| 6 | UOP-20-7 | 1,23182 | 1,23090 | 0.00076 | 4.81 | 64.01 | .49 |
| 7 | UOP-20-8 | 1,21294 | 1,21169 | 0.00109 | 6.89 | 57.12 | .22 |
| F | UOP-20F | 1,29128 | 1,28192 | 0.00903 | 57.12 | | |

TOTAL WITH FILTER 15.81 mg

TOTAL WITHOUT FILTER 6.78 mg

Blank correction value = -0.00016 Stages 0 through 7

Blank correction value = -0.00033 Stage F (final filter)

[a] Includes appropriate blank corection factor.

[b] Calculations based on total sample weight with filter are entered on first line; calculations based on total sample weight without filter are entered on second line for each stage.

Comments: Cyclone rinse = 1.21 mg 7.65% (92.35 cum %)

12.52 Dp50

**ACUREX Corporation**

# ANDERSEN PARTICLE SIZE ANALYSIS

Plant CHEVRON SUS-69
Test Location BLANK
Run No.
Flow Rate

Tare Weights:
Date 2/13/84
By K. BREWSTER
Location MT VIEW

Final Weights:
Date 3/5/84
By K. BREWSTER
Location MT VIEW

| STAGE NO. | FILTER NO. | FINAL WT (g) | TARE WT (g) | SAMPLE WT (g)[a] | % OF TOTAL WT[b] | CUMULATIVE % OF TOTAL WT[b] | Dp μ |
|---|---|---|---|---|---|---|---|
| 0 | UOP-24-1 | 1,22138 | 1,22080 | .00058 | | | |
| 1 | UOP-24-2 | 1,21042 | 1,21021 | .00021 | | | |
| 2 | UOP-24-3 | 1,22256 | 1,22249 | .00007 | | | |
| 3 | UOP-24-4 | 1,20185 | 1,20186 | -.00001 | | | |
| 4 | UOP-24-5 | 1,22539 | 1,22535 | .00004 | | | |
| 5 | UOP-24-6 | 1,20843 | 1,20817 | .00026 | | | |
| 6 | UOP-24-7 | 1,23253 | 1,23248 | .00005 | | | |
| 7 | UOP-24-8 | 1,21429 | 1,21420 | .00009 | | | |
| F | UOP-24-F | 1,27939 | 1,27906 | .00033 | | | |
| | | | TOTAL WITH FILTER | | | | |
| | | | TOTAL WITHOUT FILTER | | | | |

Blank correction value = ______ Stages 0 through 7

Blank correction value = -0- Stage F (final filter)

---

[a] Includes appropriate blank corection factor.

[b] Calculations based on total sample weight with filter are entered on first line; calculations based on total sample weight without filter are entered on second line for each stage.

Comments:

# ACUREX
# ANALYTICAL REPORT

**Sample of:** Chevron SVS-69 (EPA)

**Sample Date:** 2-22-84

**Requested By:** Regan Best

**I.D. Number:**

**Analytical Method:** Gravimetric analysis of Anderson cyclone rinses

**Date of Analysis:** 3-7-84

| Lab I.D. Number | Component | Analytical Result | Unit |
|---|---|---|---|
| 902226 Blank tin # 186 | particulate | +0.12 | mg |
| * 902229 Test 1 tin # 184 | | 0.00 | |
| * 902230 Test 2 tin # 185 | | +1.21 | |

* these weights are blank-corrected.

**Analysis By** Ken Brewster

**Date** 3-8-84

## 5.5 SULFUR OXIDES EMISSIONS FROM CONTROLLED CONDENSATION SYSTEM SAMPLES

ISOKINETIC PERFORMANCE WORKSHEET & PARTICULATE CALCULATIONS

Plant Chevron CEZR I
Performed by Best
Date 2-23-84
Sample Location SVS-69 Outlet
Test No./Type CCS-1

| | | |
|---|---|---|
| Barometric Pressure (in. Hg) | $P_b$ | 29.34 |
| Meter volume (std), $17.64 \left(\frac{V_m}{\alpha}\right)\left(\frac{P_b + \frac{\Delta H}{13.6}}{T_m + 460}\right)$<br>$17.64 \left(\frac{20.715}{(1.00)}\right)\left(\frac{(29.34) + \frac{(0.4)}{13.6}}{(62.2) + 460}\right)$ | $V_{m\ std}$ | 20.357 |
| Volume of liquid collected (grams) | $Vl_c$ | 61 |
| Volume of liquid at standard condition (scf)<br>$Vl_c \times 0.04707$ | $V_{w\ std}$ | 2.87 |
| Stack gas proportion of water vapor<br>$\frac{V_{w\ std}}{V_{w\ std} + V_{m\ std}}, \frac{(2.87)}{(2.87) + (20.357)}$ | $B_{wo}$ | 12.4 |
| Molecular weight, stack gas dry (lb/lb-mole)<br>$(\%\ CO_2 \times 0.44) + (\%\ O_2 \times 0.32) + (\%\ N_2 + \%\ CO \times 0.28)$<br>$(\_\_\_ \times 0.44) + (\_\_\_ \times 0.32) + (\_\_\_ + \_\_\_ \times 0.28)$ | $M_d$ | |
| Molecular weight, stack gas wet (lb/lb-mole)<br>$Md(1-B_{wo}) + 18(B_{wo}), (\_\_\_)(1-\_\_\_) + 18(\_\_\_)$ | $M_s$ | |
| Absolute stack pressure (in. Hg)<br>$P_b + \frac{P_{stack}\ (in.\ H_2O)}{13.6}, (\_\_\_) + \frac{(\_\_\_)}{13.6}$ | $P_s$ | |

Form 440 3/84

## ISOKINETIC PERFORMANCE WORKSHEET & PARTICULATE CALCULATIONS

Plant Chevron (EZR) Performed by Bost
Date 2-23-84
Sample Location SWS -69 (Outlet)
Test No./Type CCS -2

| | | |
|---|---|---|
| Barometric Pressure (in. Hg) | $P_b$ | 29.32 |
| Meter volume (std), $17.64 \left(\frac{V_m}{\alpha}\right)\left(\frac{P_b + \frac{\Delta H}{13.6}}{T_m + 460}\right)$<br>$17.64 \left(\frac{(20.924)}{(1.00)}\right)\left(\frac{(29.32) + \frac{(0.4)}{13.6}}{(61.7) + 460}\right)$ | $V_m$ std | 20.765 |
| Volume of liquid collected (grams) | $Vl_c$ | 60. |
| Volume of liquid at standard condition (scf)<br>$Vl_c \times 0.04707$ | $V_w$ std | 2.82 |
| Stack gas proportion of water vapor<br>$\frac{V_{w\ std}}{V_{w\ std} + V_{m\ std}}$, $\frac{(2.82)}{(2.82) + (20.77)}$ | $B_{wo}$ | 12.0 |
| Molecular weight, stack gas dry (lb/lb-mole)<br>$(\%\ CO_2 \times 0.44) + (\%\ O_2 \times 0.32) + (\%\ N_2 + \%\ CO \times 0.28)$<br>(___ x 0.44) + (___ x 0.32) + (___ + ___ x 0.28) | $M_d$ | |
| Molecular weight, stack gas wet (lb/lb-mole)<br>$Md(1-B_{wo}) + 18(B_{wo})$, (___)(1-___) + 18(___) | $M_s$ | |
| Absolute stack pressure (in. Hg)<br>$P_b + \frac{P_{stack}\ (in.\ H_2O)}{13.6}$, (___) + $\frac{(\_\_\_)}{13.6}$ | $P_s$ | |

Form 440 3/84

# ACUREX
# ANALYTICAL REPORT

Sample of: CMEA/EER

Sample Date: 2-23-84

Requested By: Waterland

I.D. Number: 307735.81

Analytical Method: Sulfate titrations of CCS Samples

Date of Analysis: 3-29-84

| Lab I.D. Number | Component | Analytical Result | Unit |
|---|---|---|---|
| 902296, 902292, 902295 | Run 1 probe, filter, coil rinse | 109.1 | mg $SO_4$ per sample |
| 902291 | $H_2O_2$ impinger Run 1 | 1382.4 | |
| 902302, 902297, 902293 | Run 2 probe, filter, coil rinse | 119.2 | |
| 902300 | Run 2 $H_2O_2$ impinger | 1434.7 | |
| 902301 | D.I. blank | 0.0 | |
| 902298 | $H_2O_2$ blank | 0.0 | |

Analysis By: Best

Date: 3-29-84

## 5.6 TRACE ELEMENT ANALYSES OF FUEL AND SASS SAMPLES

In the following, samples labeled fuel, test 1 and fuel, test 2 are blind duplicate samples of the same material.

**COMMERCIAL TESTING & ENGINEERING CO.**
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300

ROBERT L. TAYLOR, Ph.D.
MANAGER
INSTRUMENTAL ANALYSIS DIVISION

SINCE 1908

PLEASE ADDRESS ALL CORRESPONDENCE TO:
490 ORCHARD ST., GOLDEN, CO 80401
OFFICE TEL. (303) 278-9521

May 16, 1984

Mr. Christopher Mann
Acurex Corporation
P.O. Box 7555
Mountain View, CA 94042

RE: IAD #97-P137-116-10
Subcontract #SW59159A
Release #15

Analytical Report

Ten samples were received for analysis on April 2, 1984. These samples were assigned our IAD identification #97-P137-116-10.

Trace element determinations using Spark Source Mass Spectrometry per EPA level 1 protocol are reported in separate attached reports.

Arsenic and Antimony were determined on two of the samples using hydride generation atomic absorption spectrophotometry. Mercury was determined on all ten samples using flameless cold vapor atomic absorption spectrophotometry. The results of these determinations are presented in Table No. I and are reported in parts per million (ppm) by weight on an "as received" basis.

Carbon and Hydrogen were determined on four samples by an external laboratory. The results of these determinations are presented in Table No. II and are reported in weight percent (Wt.%) on an "as received" basis.

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES INC.
Charter Member

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

Table No. I
(ppm by Wt.)

| Sample ID | Arsenic (As) | Antimony (Sb) | Mercury (Hg) |
|---|---|---|---|
| 901458 EOR Filter | -- | -- | 0.04 * |
| 901459 EOR Filter Blank | -- | -- | ≤0.02 * |
| 901454 EOR XAD-2 | -- | -- | 0.52 |
| 901475 EOR XAD-2 Blank | -- | -- | ≤0.4 |
| 901463 EOR Impinger 1 | -- | -- | 0.0031 |
| 901461 EOR Impinger 1 Blank | -- | -- | 0.0089 |
| 901440 EOR Fuel, Test 1 | -- | -- | ≤0.4 |
| 901441 EOR Fuel, Test 2 | -- | -- | ≤0.4 |
| 901464 EOR Impinger 2 and 3 | 0.012 | ≤0.004 | 0.004 |
| 901462 EOR Impinger 2 & 3 Blank | 0.005 | ≤0.004 | ≤0.002 |

* Reported in ppm by weight of the filter.

Table No. II
(Wt.%-As Received)

| Sample ID | Carbon | Hydrogen |
|---|---|---|
| 901458 EOR Filter | 0.14 ** | 0.17 ** |
| 901459 EOR Filter Blank | 0.05 ** | 0.02 ** |
| 901440 EOR Fuel, Test 1 | 85.67 | 11.22 |
| 901441 EOR Fuel, Test 2 | 85.91 | 11.36 |

** Reported in weight per cent of the filter.

If you have any questions concerning these results, please call.

Harold A. Connell
Harold A. Connell
Assistant Laboratory Manager

Robert L. Taylor 16 May 84
Robert L. Taylor, Ph.D., Manager
Instrumental Analysis Division

HAC/gh

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For Your Protection

**COMMERCIAL TESTING & ENGINEERING CO.**
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300
Reply to
INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: May 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A, Release # 15, Project #EE7734.82

Sample No.: 901440
EOR Fuel
Test 1

IAD No.: 97-P137-116-70

SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS
CONCENTRATION IN PPM WEIGHT

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | | Terbium | | Ruthenium | | Vanadium | 6 |
| Thorium | | Gadolinium | | Molybdenum | *2 | Titanium | 3 |
| Bismuth | | Europium | | Niobium | 0.09 | Scandium | ≤0.09 |
| Lead | 0.6 | Samarium | | Zirconium | 0.2 | Calcium | 13 |
| Thallium | | Neodymium | | Yttrium | 0.06 | Potassium | 5 |
| Mercury | NR | Praseodymium | | Strontium | 0.2 | Chlorine | *MC |
| Gold | | Cerium | | Rubidium | 0.02 | Sulfur | MC |
| Platinum | **1 | Lanthanum | | Bromine | 0.2 | Phosphorus | 4 |
| Iridium | | Barium | 0.8 | Selenium | 0.5 | Silicon | 19 |
| Osmium | | Cesium | | Arsenic | 0.06 | Aluminum | 9 |
| Rhenium | | Iodine | 0.5 | Germanium | | Magnesium | 8 |
| Tungsten | | Tellurium | | Gallium | 0.2 | Sodium | 10 |
| Tantalum | | Antimony | | Zinc | 2 | Fluorine | ≈27 |
| Hafnium | | Tin | | Copper | 0.7 | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 6 | Nitrogen | NR |
| Ytterbium | | Cadmium | | Cobalt | 0.6 | Carbon | NR |
| Thulium | | Silver | | Iron | 10 | Boron | 0.2 |
| Erbium | | Palladium | | Manganese | 0.4 | Beryllium | |
| Holmium | | Rhodium | | Chromium | 0.4 | Lithium | 0.5 |
| Dysprosium | | | | | | Hydrogen | NR |

*Heterogeneous
**Probable Contamination From Sample Preparation

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.7 ppm
MC — Major Component > 100 ppm
INT — Interference

Approved: Robert L. Taylor
16 May 84

gh

**COMMERCIAL TESTING & ENGINEERING CO.**
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300
Reply to INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: May 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A, Release #15, Project #EE7734.82

Sample No.: 901441
EOR Fuel
Test 2

SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS
CONCENTRATION IN PPM WEIGHT

IAD No.: 97-P137-116-10

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | | Terbium | | Ruthenium | | Vanadium | 2 |
| Thorium | | Gadolinium | | Molybdenum | 0.3 | Titanium | 4 |
| Bismuth | | Europium | | Niobium | 0.03 | Scandium | ≤0.03 |
| Lead | 0.5 | Samarium | | Zirconium | 0.06 | Calcium | 5 |
| Thallium | | Neodymium | | Yttrium | 0.04 | Potassium | 3 |
| Mercury | NR | Praseodymium | | Strontium | 0.2 | Chlorine | 19 |
| Gold | | Cerium | | Rubidium | | Sulfur | MC |
| Platinum | | Lanthanum | | Bromine | 0.06 | Phosphorus | 2 |
| Iridium | | Barium | 0.3 | Selenium | 0.4 | Silicon | 9 |
| Osmium | | Cesium | | Arsenic | 0.05 | Aluminum | 1 |
| Rhenium | | Iodine | 0.5 | Germanium | ≤0.02 | Magnesium | 5 |
| Tungsten | | Tellurium | | Gallium | 0.2 | Sodium | MC |
| Tantalum | | Antimony | | Zinc | 2 | Fluorine | ≃4 |
| Hafnium | | Tin | | Copper | 0.7 | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 20 | Nitrogen | NR |
| Ytterbium | | Cadmium | | Cobalt | 0.2 | Carbon | NR |
| Thulium | | Silver | | Iron | 5 | Boron | 0.08 |
| Erbium | | Palladium | | Manganese | 0.3 | Beryllium | <0.01 |
| Holmium | | Rhodium | | Chromium | 0.4 | Lithium | 0.2 |
| Dysprosium | | | | | | Hydrogen | NR |

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.02 ppm
MC — Major Component > 100 ppm
INT — Interference

Approved: Robert C. Taylor
16 May 84

gh

# COMMERCIAL TESTING & ENGINEERING CO.

Reply to

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300
INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: may 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A Release 15 Project 7601

Sample No.: 901458
EOR Filter

SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS

IAD No.: 97-P137-116-10

CONCENTRATION IN PPM WEIGHT of the Filter

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | 1 | Terbium | 0.8 | Ruthenium | | Vanadium | MC |
| Thorium | 8 | Gadolinium | 4 | Molybdenum | 12 | Titanium | 44 |
| Bismuth | 0.2 | Europium | 0.4 | Niobium | 0.8 | Scandium | 4 |
| Lead | 3 | Samarium | 4 | Zirconium | 3 | Calcium | MC |
| Thallium | 0.4 | Neodymium | 12 | Yttrium | 24 | Potassium | MC |
| Mercury | NR | Praseodymium | 4 | Strontium | 16 | Chlorine | MC |
| Gold | | Cerium | 12 | Rubidium | 0.8 | Sulfur | MC |
| Platinum | | Lanthanum | 16 | Bromine | 8 | Phosphorus | MC |
| Iridium | | Barium | 36 | Selenium | 4 | Silicon | MC |
| Osmium | | Cesium | 0.4 | Arsenic | 16 | Aluminum | MC |
| Rhenium | | Iodine | 0.8 | Germanium | 2 | Magnesium | MC |
| Tungsten | 0.4 | Tellurium | 3 | Gallium | 12 | Sodium | MC |
| Tantalum | 2 | Antimony | 8 | Zinc | 64 | Fluorine | ≅170 |
| Hafnium | | Tin | 4 | Copper | 8 | Oxygen | NR |
| Lutetium | 0.4 | Indium | STD | Nickel | MC | Nitrogen | NR |
| Ytterbium | 1 | Cadmium | 0.2 | Cobalt | 56 | Carbon | NR |
| Thulium | 0.4 | Silver | 1 | Iron | MC | Boron | 1 |
| Erbium | 2 | Palladium | | Manganese | 20 | Beryllium | 0.4 |
| Holmium | 2 | Rhodium | | Chromium | 36 | Lithium | 17 |
| Dysprosium | 4 | | | | | Hydrogen | NR |

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.1 ppm
MC — Major Component >1000 ppm
INT — Interference

Approved: Robert L. Taylor
16 May 84

# COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300

Reply to INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

**To:** Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

**Date:** May 16, 1984

**Analyst:** G. Meagher

**P. O. No.:** Subcontract SW59159A Release 15 Project 7601

**Sample No.:** 901459
EOR Filter Blank

SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS

**IAD No.:** 97-P137-116-10

CONCENTRATION IN PPM WEIGHT of the Filter

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | | Terbium | | Ruthenium | | Vanadium | 3 |
| Thorium | | Gadolinium | | Molybdenum | 2 | Titanium | 24 |
| Bismuth | | Europium | | Niobium | ≤0.2 | Scandium | 0.3 |
| Lead | | Samarium | | Zirconium | 3 | Calcium | MC |
| Thallium | | Neodymium | | Yttrium | 0.8 | Potassium | 56 |
| Mercury | NR | Praseodymium | 0.2 | Strontium | 4 | Chlorine | 64 |
| Gold | | Cerium | 0.1 | Rubidium | <0.1 | Sulfur | 24 |
| Platinum | | Lanthanum | 0.2 | Bromine | 2 | Phosphorus | 12 |
| Iridium | | Barium | 28 | Selenium | 0.2 | Silicon | 84 |
| Osmium | | Cesium | | Arsenic | 0.2 | Aluminum | MC |
| Rhenium | | Iodine | 0.2 | Germanium | 0.1 | Magnesium | 340 |
| Tungsten | | Tellurium | | Gallium | 0.3 | Sodium | 240 |
| Tantalum | | Antimony | | Zinc | 4 | Fluorine | ≅64 |
| Hafnium | | Tin | | Copper | 2 | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 12 | Nitrogen | NR |
| Ytterbium | | Cadmium | ≤0.3 | Cobalt | ≤0.3 | Carbon | NR |
| Thulium | | Silver | | Iron | 80 | Boron | 4 |
| Erbium | 8 | Palladium | | Manganese | 2 | Beryllium | |
| Holmium | | Rhodium | | Chromium | 8 | Lithium | 0.8 |
| Dysprosium | | | | | | Hydrogen | NR |

STD — Internal Standard
NR — Not Reported
All elements not detected <0.2 ppm
MC — Major Component >1000 ppm
INT — Interference

Approved: Robert L. Taylor
16 May 84

**COMMERCIAL TESTING & ENGINEERING CO.**

Reply to
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300
INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: May 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A, Release # 15, Project #EE7734.82

Sample No.: 901454
EOR XAD-2

IAD No.: 97-P137-116-10

## SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS
CONCENTRATION IN PPM WEIGHT

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | | Terbium | | Ruthenium | | Vanadium | 0.09 |
| Thorium | | Gadolinium | | Molybdenum | 0.8 | Titanium | 4 |
| Bismuth | | Europium | | Niobium | | Scandium | 0.2 |
| Lead | 0.4 | Samarium | | Zirconium | 0.1 | Calcium | 17 |
| Thallium | | Neodymium | | Yttrium | | Potassium | 12 |
| Mercury | NR | Praseodymium | | Strontium | 0.2 | Chlorine | 4 |
| Gold | | Cerium | | Rubidium | | Sulfur | 6 |
| Platinum | *0.6 | Lanthanum | | Bromine | | Phosphorus | 2 |
| Iridium | | Barium | 0.9 | Selenium | | Silicon | 13 |
| Osmium | | Cesium | | Arsenic | 0.07 | Aluminum | 1 |
| Rhenium | | Iodine | 0.1 | Germanium | 0.05 | Magnesium | 9 |
| Tungsten | | Tellurium | | Gallium | 0.08 | Sodium | 3 |
| Tantalum | | Antimony | | Zinc | 3 | Fluorine | ≈8 |
| Hafnium | | Tin | | Copper | 0.4 | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 0.6 | Nitrogen | NR |
| Ytterbium | | Cadmium | | Cobalt | 0.04 | Carbon | NR |
| Thulium | | Silver | | Iron | 5 | Boron | 0.7 |
| Erbium | | Palladium | | Manganese | 0.4 | Beryllium | |
| Holmium | | Rhodium | | Chromium | 0.4 | Lithium | 0.3 |
| Dysprosium | | | | | | Hydrogen | NR |

*Probable Contamination From Sample Preparation

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.08 ppm
MC — Major Component > 100 ppm
INT — Interference

Approved: Robert L. Taylor
16 May 84

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# COMMERCIAL TESTING & ENGINEERING CO.

Reply to

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300
INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: May 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A, Release # 15, Project #EE7734.82

Sample No.: 901475
EOR XAD-2 Blank

IAD No.: 97-P137-116-10

## SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS

## CONCENTRATION IN PPM WEIGHT

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | | Terbium | | Ruthenium | | Vanadium | 0.07 |
| Thorium | | Gadolinium | | Molybdenum | 0.7 | Titanium | 5 |
| Bismuth | | Europium | | Niobium | | Scandium | 0.3 |
| Lead | | Samarium | | Zirconium | 0.1 | Calcium | *13 |
| Thallium | | Neodymium | | Yttrium | | Potassium | 4 |
| Mercury | NR | Praseodymium | | Strontium | 0.09 | Chlorine | 17 |
| Gold | | Cerium | | Rubidium | | Sulfur | 1 |
| Platinum | **0.3 | Lanthanum | | Bromine | | Phosphorus | 3 |
| Iridium | | Barium | 0.5 | Selenium | | Silicon | 15 |
| Osmium | | Cesium | | Arsenic | 0.04 | Aluminum | 1 |
| Rhenium | | Iodine | 0.09 | Germanium | ≤0.04 | Magnesium | 8 |
| Tungsten | | Tellurium | | Gallium | 0.08 | Sodium | 8 |
| Tantalum | | Antimony | | Zinc | 0.7 | Fluorine | ≈44 |
| Hafnium | | Tin | | Copper | 0.6 | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 0.5 | Nitrogen | NR |
| Ytterbium | | Cadmium | 0.1 | Cobalt | ≤0.07 | Carbon | NR |
| Thulium | | Silver | | Iron | 6 | Boron | 0.2 |
| Erbium | | Palladium | | Manganese | 0.3 | Beryllium | |
| Holmium | | Rhodium | | Chromium | 0.5 | Lithium | 0.3 |
| Dysprosium | | | | | | Hydrogen | NR |

*Heterogeneous
**Probable Contamination From Sample Preparation

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.04 ppm
MC — Major Component > 100 ppm
INT — Interference

Approved: Robert L. Taylor
16 May 84

gh

**COMMERCIAL TESTING & ENGINEERING CO.**
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300
Reply to INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: May 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A, Release # 15, Project #EE7734.82

Sample No.: XAD-2
Preparation Reagent Blank

SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS
CONCENTRATION IN PPM WEIGHT

IAD No.: 97-P137-116-10

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | ≤0.4 | Terbium | | Ruthenium | | Vanadium | 0.04 |
| Thorium | 0.8 | Gadolinium | | Molybdenum | ≤0.2 | Titanium | 0.6 |
| Bismuth | | Europium | | Niobium | | Scandium | 0.2 |
| Lead | 1 | Samarium | | Zirconium | 0.4 | Calcium | 11 |
| Thallium | | Neodymium | 0.6 | Yttrium | 0.2 | Potassium | 7 |
| Mercury | NR | Praseodymium | 0.4 | Strontium | 0.2 | Chlorine | 8 |
| Gold | **2 | Cerium | 1 | Rubidium | | Sulfur | 1 |
| Platinum | | Lanthanum | 1 | Bromine | | Phosphorus | 10 |
| Iridium | | Barium | 0.6 | Selenium | | Silicon | *20 |
| Osmium | | Cesium | | Arsenic | 0.1 | Aluminum | 2 |
| Rhenium | | Iodine | 0.06 | Germanium | 0.02 | Magnesium | 52 |
| Tungsten | | Tellurium | | Gallium | 0.2 | Sodium | 5 |
| Tantalum | | Antimony | | Zinc | 4 | Fluorine | ≃40 |
| Hafnium | | Tin | | Copper | 1 | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 0.6 | Nitrogen | NR |
| Ytterbium | | Cadmium | | Cobalt | 0.06 | Carbon | NR |
| Thulium | | Silver | 0.2 | Iron | 18 | Boron | 0.2 |
| Erbium | | Palladium | | Manganese | 0.2 | Beryllium | |
| Holmium | | Rhodium | | Chromium | 0.2 | Lithium | 0.6 |
| Dysprosium | | | | | | Hydrogen | |

*Heterogeneous
**Probable Contamination

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.04 ppm
MC — Major Component > 100 ppm
INT — Interference

Approved: Robert L. Taylor
gh
16 May 84

**COMMERCIAL TESTING & ENGINEERING CO.**

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300

Reply to INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: May 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A, Release #15, Project #EE7734.82

Sample No.: 901463
EOR
Impinger 1

IAD No.: 97-P137-116-10

SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS

CONCENTRATION IN μg/mL

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | | Terbium | | Ruthenium | | Vanadium | 0.05 |
| Thorium | | Gadolinium | | Molybdenum | 1 | Titanium | 1 |
| Bismuth | | Europium | | Niobium | ≤0.04 | Scandium | 0.5 |
| Lead | 6 | Samarium | | Zirconium | 0.06 | Calcium | 2 |
| Thallium | | Neodymium | | Yttrium | 0.01 | Potassium | 2 |
| Mercury | NR | Praseodymium | 0.01 | Strontium | 0.1 | Chlorine | 5 |
| Gold | | Cerium | | Rubidium | 0.01 | Sulfur | MC |
| Platinum | | Lanthanum | | Bromine | 0.2 | Phosphorus | 2 |
| Iridium | | Barium | 0.2 | Selenium | 0.5 | Silicon | 4 |
| Osmium | | Cesium | 0.004 | Arsenic | 0.05 | Aluminum | 0.9 |
| Rhenium | | Iodine | 0.1 | Germanium | 0.09 | Magnesium | MC |
| Tungsten | | Tellurium | 0.09 | Gallium | 0.04 | Sodium | MC |
| Tantalum | | Antimony | 0.03 | Zinc | MC | Fluorine | MC |
| Hafnium | | Tin | 0.2 | Copper | MC | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 3 | Nitrogen | NR |
| Ytterbium | | Cadmium | ≤0.02 | Cobalt | ≤0.01 | Carbon | NR |
| Thulium | | Silver | 0.09 | Iron | 6 | Boron | 0.02 |
| Erbium | | Palladium | | Manganese | 0.2 | Beryllium | |
| Holmium | ≤0.2 | Rhodium | | Chromium | 3 | Lithium | 0.08 |
| Dysprosium | | | | | | Hydrogen | NR |

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.008 μg/mL
MC — Major Component > 10 μg/mL
INT — Interference

Approved: Robert L. Taylor
16 May 84

gh

# COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 AREA CODE 312 953-9300

Reply to INSTRUMENTAL ANALYSIS DIVISION, 490 ORCHARD STREET, GOLDEN, COLORADO 80401, PHONE: 303 278-9521

To: Acurex Corporation
555 Clyde Avenue
P.O. Box 7555
Mountain View, CA 94039

Date: May 16, 1984

Analyst: G. Meagher

P. O. No.: Subcontract SW59159A, Release #15, Project #EE7734.82

Sample No.: 901461
EOR Impinger
1 Blank

SPARK SOURCE MASS SPECTROGRAPHIC ANALYSIS

CONCENTRATION IN µg/mL

IAD No.: 97-P137-116-10

| ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. | ELEMENT | CONC. |
|---|---|---|---|---|---|---|---|
| Uranium | | Terbium | | Ruthenium | | Vanadium | 0.003 |
| Thorium | | Gadolinium | | Molybdenum | 0.03 | Titanium | 0.04 |
| Bismuth | | Europium | | Niobium | ≤0.004 | Scandium | 0.005 |
| Lead | | Samarium | | Zirconium | 0.01 | Calcium | 0.4 |
| Thallium | | Neodymium | | Yttrium | | Potassium | 0.2 |
| Mercury | NR | Praseodymium | | Strontium | 0.003 | Chlorine | *6 |
| Gold | | Cerium | | Rubidium | | Sulfur | MC |
| Platinum | | Lanthanum | | Bromine | 0.008 | Phosphorus | 1 |
| Iridium | | Barium | 0.02 | Selenium | 0.006 | Silicon | 0.6 |
| Osmium | | Cesium | | Arsenic | ≤0.002 | Aluminum | 0.05 |
| Rhenium | | Iodine | 0.03 | Germanium | ≤0.002 | Magnesium | 0.7 |
| Tungsten | | Tellurium | 0.006 | Gallium | 0.003 | Sodium | MC |
| Tantalum | | Antimony | ≤0.009 | Zinc | 0.02 | Fluorine | ≈0.3 |
| Hafnium | | Tin | 0.2 | Copper | 0.002 | Oxygen | NR |
| Lutetium | | Indium | STD | Nickel | 0.01 | Nitrogen | NR |
| Ytterbium | | Cadmium | | Cobalt | 0.004 | Carbon | NR |
| Thulium | | Silver | | Iron | 0.06 | Boron | 0.002 |
| Erbium | | Palladium | | Manganese | 0.01 | Beryllium | |
| Holmium | | Rhodium | | Chromium | 0.01 | Lithium | 0.01 |
| Dysprosium | | *Heterogeneous | | | | Hydrogen | NR |

STD — Internal Standard
NR — Not Reported
All elements not detected < 0.003 µg/mL
MC — Major Component > 10 µg/mL
INT — Interference

Approved: Robert L. Taylor
gh
16 May 84

**COMMERCIAL TESTING & ENGINEERING CO.**
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300

GERALD T. SKAR
MANAGER
INSTRUMENTAL ANALYSIS DIVISION

SINCE 1908

PLEASE ADDRESS ALL CORRESPONDENCE TO:
490 ORCHARD ST., GOLDEN, CO. 80401
OFFICE TEL. (303) 278-9521

August 2, 1984

Mr. Larry Waterland
Acurex Corporation
P.O. Box 7555
Mountain View, CA 94039

RE: IAD #97-P897-116-06
Subcontract #SW 59159A
Release #16

## Analytical Report

Six samples, previously analyzed for trace elements by spark source mass spectrometry, under our IAD identification #97-P137-116-10, were logged in under our IAD identification #97-P897-116-06 on July 16, 1984, for additional analysis.

Chlorine and fluorine were determined using specific ion electrode methodology. Phosphorus was determined colorimetrically.

Depending on sample type and the amount of sample available, sulfur was determined turbidimetrically or by X-ray fluorescence spectrometry.

The remaining elemental analysis was performed using flame atomic absorption/emission spectrophotometry.

The results of these determinations are presented in the following tables. Samples #1 and 2 are reported in total micrograms (μg) on the filter. Samples #3 and 4 are reported in micrograms per millilitre (μg/mL). Samples #5 and 6 are reported in micrograms per gram (μg/g). All values are reported on an "as received" basis.

If you have any questions concerning these results, please call.

Harold A. Connell
Harold A. Connell
Project Coordinator

HAC/as

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.
Charter Member

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

## Table No. I
(Total µg on the Filter)

| Parameter | #1 - 901458 EOR Filter | #2 - 901459 EOR Filter Blank |
|---|---|---|
| Aluminum, (Al) | 7,000 | 3,740 |
| Calcium, (Ca) | 16,000 | -- |
| Chlorine, (Cl) | 44,300 | -- |
| Iron, (Fe) | 10,150 | -- |
| Potassium, (K) | 80 | -- |
| Magnesium, (Mg) | 2,640 | -- |
| Sodium, (Na) | 1,930 | -- |
| Nickel, (Ni) | 33,100 | -- |
| Phosphorus, (P) | 590 | -- |
| Sulfur, (S) | 125 | -- |
| Silicon, (Si) | 780 | -- |
| Vanadium, (V) | 1,320 | -- |

## Table No. II
(µg/mL)

| Parameter | #3 - 901463 EOR Impinger 1 | #4 - 901461 EOR Impinger 1 Blank |
|---|---|---|
| Copper, (Cu) | 71.9 | -- |
| Fluorine, (F) | 0.89 | -- |
| Magnesium, (Mg) | 0.14 | -- |
| Sodium, (Na) | 4,960 | 0.39 |
| Sulfur, (S) | 6,920 | ≤50 |
| Zinc, (Zn) | 30 | -- |

## Table No. III
(µg/g)

| Parameter | #5 - 901440 EOR Fuel, Test 1 | #6 - 901441 EOR Fuel, Test 2 |
|---|---|---|
| Chlorine, (Cl) | 25 | 21 |
| Sodium, (Na) | 132 | 104 |
| Sulfur, (S) | 11,700 | 11,600 |

Original Copy Watermarked
For Your Protection

## 5.7 ORGANIC ANALYSES OF SASS SAMPLES: TOTAL CHROMATOGRAPHABLE ORGANICS (TCO), GRAVIMETRIC ORGANICS (GRAV), GAS CHROMATOGRAPHY MASS SPECTROMETRY (GC/MS), and INFRARED (IR) SPECTRA OF TOTAL SAMPLE EXTRACTS

ACUREX
Corporation

Energy & Environmental Division

Acurex/ES
MS 2-2260

April 18, 1984
Acurex ID#: 8402-006
Client PO#: 307736.82

Attention: Larry Waterland

Sample: Bakersfield, 1 SASS Train;
Received 2/3/84

The above samples were analyzed by Level 1 protocol. The XAD and OMC extracts were combined per your instruction. Organic extracts were also analyzed for the semivolatile priority pollutants by gas chromatography/mass spectrometry employing a J&W SE-54 30 meter capillary column. The column was held at 30°C for 2 minutes, then ramped at 10°C per minute to 270°C . In addition to the priority pollutants, benzo(c)phenanthrene, dibenzo(c,g)carbazole, 7,12-dimethylbenzo(a)anthracene, 3-methylcholanthrene, and perylene were sought employing the computerized library search and manual interpretation. The assignment and quantitation of these organics is tentative since analytical standards of these compounds were not available for analysis. Benzo(c)phenanthrene, dibenzo(c,g)carbazole, 7-12-dimethylbenzo(a)anthracene, 3-methylcholanthrene and perylene were not detected in any of the samples at levels above 100 ug per train.

After extraction of the XAD field blank, the same resin was spiked with 400 ug each of dodecane and hexadecane for TCO analysis, 400 ug each of naphthalene, phenanthrene, and pyrene for PAH analysis, and 10 mg of bis(2-ethylhexyl)phthalate which combined with the phenanthrene and pyrene for the GRAV analysis. Results are presented in Tables 1 through 3. Chromatograms and spectra are attached.

Submitted by:

Greg Nicoll
Greg Nicoll
Manager, Inorganic Chemistry

Viorica Lopez Avila
Viorica Lopez-Avila, Ph.D.
Technical Director

GN/VLA/ats

Attachments

555 Clyde Avenue, P.O. Box 7555, Mountain View, CA 94039 (415) 964-3200 Telex: 34-6391 TWX: 910-7796593

Table 1. TCO and GRAV Results

| Sample ID | TCO | GRAV |
|---|---|---|
| Filters | -- | <3 mg/train |
| XAD* | 4.1 mg/train | 6 mg/train |
| XAD blank | 0.34 mg/train | 3 mg/train |
| XAD spike | 784 ug | 11 mg |
| XAD spike level | 800 ug** | 10.8 mg*** |
| XAD spike recovery | 98% | 102% |

* Blank corrected

** 400 ug each of C(12) and C(16)-alkanes

*** 10 mg of bis(2-ethylhexyl)phthalate, 400 ug of phenanthrene, and 400 ug of pyrene

Table 2. GC/MS Results, ug/train

| Analyte | XAD | XAD* | Spiked XAD | % Recovery of spiked XAD |
|---|---|---|---|---|
| Dibutylphthalate | <50 | <50 | NS*** | -- |
| Dimethylphthalate | 100 | 60 | NS | -- |
| Naphthalene | 40 | 20 | 420 | 105 |
| Phenanthrene | <10 | <10 | 400 | 100 |
| Phenol | 20 | 10 | NS | -- |
| Pyrene | <10 | <10 | 510 | 128 |
| Other Priority Pollutants | ND** | ND | NS | -- |

* Duplicate injection
** ND - Not detected
*** NS - Not spiked

## Table 3. Sample Disposition

| Sample ID | Type | Initial | Subcontract | Organic | Remainder |
|---|---|---|---|---|---|
| 901455 #31 | Filter | -- | 32% | 68% | 62%* |
| 901456 #32 | Filter | -- | 33% | 67% | |
| 901457 #33 | Filter | -- | 28% | 72% | |
| 901458 #34 | Filter | -- | 30% | 70% | |
| 901459 #35 | Filter blank | -- | 100% | 0 | 0 |
| 901453 | OMR | 395 ml | -- | -- | -- |
| 901454 | XAD | 130 g | 5 g | 125 g | 87%* |
| 901475 | XAD blank | 130 g | 5 g | 125 g | 87%* |
| ------ | XAD spike | 125 g | 0 | 125 g | 90%* |
| 901442<br>901443<br>901444 | OMC | 1910 ml | -- | -- | -- |
| 901463 | Imp 1 | 595 mL** | 100 mL | 0 | 2550 mL |
| 901461 | Imp 1 blank | 1 L | 100 mL | 0 | 1 L |
| 901464 | Imp 2&3 | 920 mL | 100 mL | 0 | 820 mL |
| 901462 | Imp 2&3 blank | 1 L | 100 mL | 0 | 1 L |
| 901440 | Grab fuel 1A | 500 mL | 100; 100; 100 mL | 0 | 200 mL |

* as extract

** Imp 1 & OMC (aqueous) volume is 2650 mL

**IR REPORT**

**SAMPLE:** 8402-006-1 Filters

| Wave Number (cm$^{-1}$) | Intensity | Assignment | Comments |
|---|---|---|---|
| | | No Peaks | |
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**IR REPORT**

**SAMPLE:** 8402-006-7 XAD

| Wave Number (cm$^{-1}$) | Intensity | Assignment | Comments |
|---|---|---|---|
| 2930 | M | C-H Aliphatic | |
| 1732 | S | C=0 | |
| 1438 | W | CH | |
| 1255 | W | C-0 | |
| 1165 | W | C-0 | |
| 1115 | W | C-0 | |

**IR REPORT**

**SAMPLE:** 8402-006-8 XAD Blank

| Wave Number (cm$^{-1}$) | Intensity | Assignment | Comments |
|---|---|---|---|
| 2928 | S | C-H Aliphatic | |
| | | | |
| | | | Very weak spectrum |
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**IR REPORT**

**SAMPLE:** 8402-006-9 XAD Spike

| Wave Number (cm⁻¹) | Intensity | Assignment | Comments |
|---|---|---|---|
| 2931 | S | C-H Aliphatic | |
| 1728 | S | C=O | |
| 1600 | W | C=C Aromatic | |
| 1759 | W | C=C Aromatic | |
| 1463 | M | C-H Aliphatic | |
| 1381 | W | C-H Aliphatic | |
| 1275 | S | C-O | |
| 1123 | M | C-O | |
| 1073 | M | C-O | |
| 1040 | W | Unassigned | |
| 744 | W | CH | |

## 5.8 VOLATILE ORGANICS ANALYSES OF VOST TRAPS

Inhouse experiments regarding the level of precautions needed to prevent blank trap contamination during storage and shipping were being performed during the time period of these tests. As a consequence, six pairs of trap blanks were available for use in this test: two pairs of trip blanks, two pairs of field blanks, and two pairs of laboratory blanks, differing only in the manner in which they were stored. As suggested by the VOST protocol, the pair t-test was used to assess the "sameness" of each blank trap pair. Use of this test showed all six blank pairs to be the same, with a confidence level of 70 percent or greater. Therefore, a mean blank trap level for each of the volatile compounds determined, with an associated standard deviation, was used to blank-correct each sample trap analyzed. The concentration of a compound had to be present in a sample trap at a level greater than three standard deviations above the mean blank level to be considered actually present in the flue gas sampled (as suggested by the VOST protocol). Based on this criterion, only benzene, toluene, and ethylbenzene were found to be present in sample traps at levels statistically different from blank traps. Thus, only emissions of these three components are reported in Volume 1 of this report.

The analytical data report follows. Traps denoted by the suffix "A" are the Tenax/charcoal trap of a run pair.

ACUREX
Corporation

Energy & Environmental Division

Acurex/ES (CMEA)

Attention: Larry Waterland/2-2260

March 9, 1984
Acurex ID#: 8402-004
Client PO#: 307736.82
302865.65
Page 1 of 5

Subject: Analysis of 10 Pairs of Tenax Traps, Received 2/2/84

The above referenced samples were individually analyzed by GC/MS according to EPA VOST Protocol for volatile organics (EPA Method 624 Priority Pollutants).

Sample Analysis results are listed in Table 1. Blank data and recovery data from spiked Tenax traps are given in Tables 2 and 3, respectively.

If you have any questions, please call.

Prepared by: William G. Hellier
William G. Hellier
Staff Chemist

Approved by: Viorica Lopez Avila
Viorica Lopez-Avila, Ph.D.
Technical Director

WGH/VLA/ats

Table 1. Results of Volatile Organic Analyses

| | Concentration (ng/trap) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | Run #4 | Run #4 | Field Blank | Field Blank | Trip Blank | Trip Blank | Run #2 | Run #2 | Lab Blank | Lab Blank |
| Trap # | 7[a] | 33A[a] | 40[a] | 7A[a] | 42[a] | 15A[a] | 23 | 24A[b] | 8 | 10A |
| Priority Pollutants | | | | | | | | | | |
| Chloromethane | 302 | 4900 | 2260 | 27 | 523 | 58 | 960 | 87 | 290 | 53 |
| Dichloromethane | 137 | 2670 | 550 | 3050 | 396 | 4160 | 103 | 933 | 115 | 225 |
| 1,1-Dichloroethylene | ND | ND | ND | ND | ND | 8 | ND | 6 | ND | ND |
| Trans-1,2-Dichloroethylene | 2 | ND | ND | ND | ND | ND | ND | ND | ND | 3 |
| Chloroform | 28 | ND | ND | ND | ND | 12 | 24 | ND | 35 | ND |
| 1,2-Dichloroethane | 3 | ND | ND | ND | ND | 24 | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | 9 | 19 | 10 | 7 | 9 | ND | 8 | ND | 7 | 3 |
| Carbon tetrachloride | 77 | ND | ND | ND | 12 | 8 | ND | 5 | ND | 5 |
| 1,2-Dichloropropane | 4 | ND | ND | ND | ND | 22 | 4 | ND | ND | ND |
| Trichloroethylene | 8 | 3 | ND | 12 | 11 | ND | ND | ND | ND | ND |
| 1,1,2-Trichloroethane | 29 | ND | ND | ND | 30 | 29 | ND | ND | ND | ND |
| Benzene | 63 | 35 | 10 | 38 | 38 | 51 | 850 | 34 | 14 | ND |
| Tetrachloroethylene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | 47 | ND | ND | ND | ND | 10 | ND | 6 | ND | 11 |
| Toluene | 67 | 42 | 7 | 35 | 29 | 16 | 33 | 52 | 13 | 52 |
| Chlorobenzene | 10 | ND | ND | ND | ND | 12 | ND | 4 | ND | ND |
| Ethylbenzene | 8 | 6 | 2 | 29 | ND | ND | 1 | ND | 1 | ND |
| Nonpriority Pollutants | | | | | | | | | | |
| Xylenes | 11 | 9 | 4 | 30 | 8 | 15 | 7 | 10 | 5 | 15 |
| Detection Limit | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| Percent Surrogate Recovery | | | | | | | | | | |
| Toluene-$d_8$ | 65 | 86 | 13[c] | 146 | 219 | 100 | 79 | 136 | 80 | 107 |

a - Shipped in wooden boxes
b - Transport tube received broken
c - Low recovery of internal standards

ND - Not detected

Table 1. Results of Volatile Organic Analyses (Cont.)

| | Concentration (ng/trap) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | Glass Sealed | Glass Sealed | Run #1 | Run #1 | Run #3 | Run #3 | Field Blank | Field Blank | Trip Blank | Trip Blank |
| Trap # | 44 | 20A | 45 | 19A | 21[a,b] | 13[b] | 11 | 32A | 9 | 35A |
| Priority Pollutants | | | | | | | | | | |
| Chloromethane | 830 | 37 | 519 | 146 | 2240 | 66 | 721 | 28 | 1340 | 71 |
| Vinyl Chloride | ND | ND | ND | 9 | ND | ND | ND | ND | ND | ND |
| Dichloromethane | 120 | 121 | 109 | 25200 | 63 | 889 | 115 | 1550 | 118 | 204 |
| 1,1-Dichloroethylene | ND | 10 | ND | 3 | ND | ND | ND | ND | 22 | ND |
| Trans-1,2-Dichloroethylene | ND | ND | ND | 3 | ND | ND | ND | ND | ND | ND |
| Chloroform | ND | ND | 24 | ND | ND | ND | 3 | ND | ND | 3 |
| 1,2-Dichloroethane | ND | 12 | 8 | ND | ND | ND | ND | ND | ND | ND |
| 1,1,1-Trichloroethane | ND | 15 | 30 | ND | 8 | 10 | ND | 3 | 20 | 10 |
| Carbon Tetrachloride | ND | 8 | ND | ND | 46 | ND | ND | ND | ND | ND |
| 1,2-Dichloropropane | ND | ND | 27 | 17 | ND | ND | ND | ND | ND | ND |
| Trichloroethylene | ND | ND | 8 | 6 | ND | ND | 5 | ND | ND | ND |
| 1,1,2-Trichloroethane | ND | ND | ND | 54 | ND | ND | ND | ND | ND | ND |
| Benzene | 19 | 5 | 2640 | ND | 205 | 46 | 26 | 1 | 20 | 41 |
| Tetrachloroethylene | ND | 17 | 11 | 32 | ND | 21 | ND | 4 | ND | ND |
| 1,1,2,2-Tetrachloroethane | ND | 8 | ND | ND | ND | ND | ND | 3 | ND | 8 |
| Toluene | 10 | 42 | 144 | 2 | 57 | 34 | 2 | 2 | 9 | 44 |
| Ethylbenzene | 3 | 9 | 9 | 72 | 4 | 5 | ND | 2 | 4 | 7 |
| Nonpriority Pollutants | | | | | | | | | | |
| Styrene | 1 | ND | 2 | 6 | ND | ND | ND | ND | 3 | 6 |
| Xylenes | 2 | ND | 8 | ND | 6 | 10 | 4 | 7 | 3 | 9 |
| Detection Limit | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Percent Surrogate Recovery | | | | | | | | | | |
| Toluene-$d_8$ | 108 | 134 | 91 | 213[c] | 95 | 142 | 111 | 103 | 106 | 142 |

a - Transport tube received broken
b - Transported with activated charcoal
c - Low recovery of internal standards
ND - Not Detected

## Table 2. Analysis Blanks

| | Concentration (ng/Trap) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample ID | Purge Blank | Trap Blank | Purge Blank | Trap Blank | Purge Blank | Trap Blank | Purge Blank | Trap Blank |
| Date | 2/2/84 | 2/2/84 | 2/3/84 | 2/3/84 | 2/5/84 | 2/5/84 | 2/6/84 | 2/6/84 |
| Priority Pollutants | | | | | | | | |
| Chloromethane | 70 | 286 | 4 | 315 | 17 | 2130 | 63 | 64 |
| Dichloromethane | 78 | 60 | 81 | 68 | 49 | 62 | 115 | 59 |
| 1,1-Dichloroethylene | ND | 14 | ND | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | ND | 7 | ND | ND | ND | ND | ND | 11 |
| 1,1,1-Trichloroethane | ND | 59 | ND | ND | ND | ND | ND | ND |
| Trichloroethylene | 4 | 23 | ND | 2 | ND | ND | ND | ND |
| Chlorodibromomethane | ND | ND | ND | ND | ND | 15 | ND | ND |
| 1,1,2-Trichloroethane | ND | 10 | ND | 6 | ND | 24 | ND | ND |
| Benzene | 18 | 41 | 14 | 18 | 12 | 26 | 2 | 19 |
| Tetrachloroethylene | 2 | 3 | ND | 21 | ND | ND | ND | ND |
| 1,1,2,2-Tetrachloroethane | 6 | 13 | ND | 23 | ND | 41 | ND | ND |
| Toluene | 4 | 12 | 3 | 10 | 5 | 12 | ND | 12 |
| Chlorobenzene | ND | ND | ND | 7 | ND | ND | ND | ND |
| Ethylbenzene | 3 | 3 | 3 | 8 | 1 | 9 | ND | 7 |
| Nonpriority Pollutants | | | | | | | | |
| Styrene | 3 | 2 | ND | 7 | ND | 3 | 5 | 10 |
| Xylenes | 4 | 5 | 5 | 9 | ND | ND | 52 | 10 |
| Detection Limit | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Percent Surrogate Recovery | | | | | | | | |
| Toluene-$d_8$ | 100 | 95 | 93 | 91 | 96 | 102 | 104 | 109 |

ND - Not detected

Table 3. Tenax Trap Spike Recovery

| Sample ID | % Recovery | | | |
|---|---|---|---|---|
| | 200 ng Trap | 200 ng Trap | 200 ng Trap | 200 ng Trap |
| Date | 2/2/84 | 2/3/84 | 2/5/84 | 2/6/84 |
| Chloromethane | 404 | 615 | 338 | 49 |
| Bromomethane | 116 | 160 | 114 | 90 |
| Vinyl chloride | 112 | 163 | 117 | 74 |
| Chloroethane | 116 | 170 | 100 | 70 |
| Dichloromethane | 116 | 136 | 109 | 106 |
| 1,1-Dichloroethylene | 131 | 171 | 112 | 73 |
| 1,1-Dichloroethane | 128 | 161 | 114 | 84 |
| Trans-1,2-Dichloroethylene | 130 | 170 | 114 | 78 |
| Chloroform | 130 | 154 | 110 | 88 |
| 1,2-Dichloroethane | 94 | 87 | 82 | 70 |
| 1,1,1-Trichloroethane | 118 | 158 | 108 | 78 |
| Carbon tetrachloride | 118 | 161 | 110 | 60 |
| Dichlorobromomethane | 100 | 95 | 91 | 68 |
| 1,2-Dichloropropane | 93 | 65 | 96 | 139 |
| Trichloroethylene | 90 | 66 | 101 | 111 |
| 1,1,2-Trichloroethane | 39 | 54 | 113 | 58 |
| Benzene | 118 | 96 | 138 | 152 |
| Tetrachloroethylene | 100 | 78 | 102 | 84 |
| Toluene | 106 | 67 | 110 | 91 |
| Chlorobenzene | 66 | 31 | 68 | 43 |
| Ethylbenzene | 85 | 38 | 81 | 44 |
| Nonpriority Pollutants | | | | |
| Xylenes | 66 | 42 | 54 | 54 |
| Percent Surrogate Recovery | | | | |
| Toluene-$d_8$ | 104 | 72 | 105 | 95 |

## 5.9 $N_2O$ EMISSIONS BY GC/ECD

ACUREX Corporation

Energy & Environmental Division

Acurex/ES

May 21, 1984
Acurex ID#: 8404-025
Client PO#: 307736.82
Page 1 of 1

Attention: Larry Waterland

Subject: Analysis of 3 Gas Bombs for Nitrous Oxide by GC/ECD

The above referenced samples were analyzed by GC/ECD according to previously reported method.

Results are listed in the table below:

| Sample ID | $N_2O$ (ppm) |
|---|---|
| 901428 | <0.5* |
| 901448 | 2 |
| 901470 | 11 |

* Sample cylinder was not pressurized - sample may have leaked.

If you have any questions, please call.

Prepared by: William G. Hellier
William G. Hellier
Staff Chemist

Approved by: Richard B. Scott for
Viorica Lopez-Avila, Ph.D.
Technical Director

WGH/VLA/ats

## 5.10 $NO_x$ EMISSIONS BY EPA METHOD 7

Laboratory analysis data for the Method 7 test performed on January 24, 1984, was included on the forms reporting the sampling and recovery data included in Section 4.2. Analysis data for the tests performed on February 8 and 24, 1984, appear on the following pages.

# ACUREX
# ANALYTICAL REPORT

**Sample of:** CMEA/EER Bakersfield

**Sample Date:** 2-8-84

**Requested By:** Larry Waterland

**I.D. Number:** 307735.82

**Analytical Method:** EPA METHOD 7 NOx ANALYSIS

**Date of Analysis:** 3-2[illegible]-84 : Test date = 2-8-84

| Lab I.D. Number | TEST # | Analytical Result | | Unit |
|---|---|---|---|---|
| 900573 | 1 | 185.6 | 92.8 | mg NO₂/ |
| 900572 | 2 | 123.8 | 61.9 | /mg/dscm NO₂ |
| 900559 | 3 | 88.4 | 44.2 | |
| 900563 | 4 | 293.2 | 146.6 | |
| 900548 | 5 | 366.6 | 183.3 | |
| 900568 | 6 | 235.4 | 117.7 | |
| 900564 | 7 | 244.4 | 122.2 | |
| 900561 | 8 | 283.0 | 141.5 | |
| 900562 | 9 | 229.0 | 1[illegible]4.5 | |
| 900560 | 10 | 267.6 | 133.8 | |
| 900570 | 11 | 360.2 | 180.1 | |
| 900575 | 12 | 373.0 | 186.5 | |
| 900571 | 13 | 326.8 | 163.4 | |

**Analysis By** ______

**Date** 3-29-84

# ACURE X
## ANALYTICAL REPORT

**Sample of:** CMEA/EER Bakersfield

**Sample Date:** 2-8-84

**Requested By:** Larry Waterland

**I.D. Number:** 307735.82

**Analytical Method:** EPA METHOD 7 NOx ANALYSIS

**Date of Analysis:** 3-2[illegible]-84 :

| Lab I.D. Number | TEST # | Analytical Result | | Unit |
|---|---|---|---|---|
| 900555 | 14 | 57.8 | 28.9 | mg $NO_2$ / mg/dscm $NO_2$ |
| 900547 | 15 | 292.0 | 146.0 | |
| 900537 | 16 | 283.0 | 141.5 | |
| 900574 | 17 | 48.8 | 24.4 | |
| 900565 | 18 | 328.0 | 164.0 | |
| 900566 | 19 | 315.2 | 157.6 | |
| 900549 | 20 | 224.6 | 112.3 | |
| 900567 | 21 | 191.6 | 95.8 | |
| 900534 | 22 | 218.6 | 109.3 | |
| 900558 | 23 | 220.0 | 110.0 | |
| 900569 | 24 | 196.8 | 98.4 | |
| 900551 | 25 | 159.6 | 79.8 | |
| 900550 | 26 | 236.8 | 118.3 | |
| EPA QA sample #0481 | | 594.68 | 297.34* | |

*actual value = 298.5 mg/dscm $NO_2$

**Analysis By** Brewster

**Date** 3-29-84

Form EED--082 5/81

# ACURDEX

## ANALYTICAL REPORT

**Sample of:** CMEA/EER Bakersfield

**Sample Date:** 2-24-84

**Requested By:** Larry Waterland

**I.D. Number:** 307735.82

**Analytical Method:** EPA METHOD 7 NOx ANALYSIS

**Date of Analysis** 3-28-84

| Lab I.D. Number | TEST # | Analytical Result | | Unit |
|---|---|---|---|---|
| 903474 | 1 | 262.7 | 131.35 | $\mu g\ NO_2$ / |
| 903475 | 2 | 223.8 | 111.9 | mg/dscm $NO_2$ |
| 903476 | 3 | 189.99 | 94.99 | |
| 903477 | 4 | 257.62 | 128.81 | |
| 903478 | 5 | 295.45 | 147.72 | |
| 903479 | 6 | 378.37 | 189.18 | |
| 903480 | 7 | 265.66 | 132.83 | |
| 903481 | 8 | 118.38 | 59.19 | |
| 903482 | 9 | 251.18 | 125.59 | |
| 903483 | 10 | 547.43 | 273.72 | |
| | | | | |
| | | | | |
| | | | | |

**Analysis By** Ken Brewster

**Date** 3-29-84

Form EED--082 5/81